SUPPLEMENT.

The Mining Journal,

AILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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Original Correspondence.

NORTH OF ENGLAND IRON TRADE—No. VI.

THE WEST HARTLEPOOL IRONWORKS.

Richardson and Sons' works at Hartlepool are among the most complete of their kind in the North of England, and can claim a more interesting history, fewer still can ex- any specialties calculated to interest those who are en- tallurgy and engineering. As at present carried on, the prise rolling mills and forges, engineering and foundry s, a large shipbuilding yard, and now it is expected that s more will see blast furnaces in operation. There is er concern in the North of England that embraces so ations. We refer to Palmer's Iron Shipbuilding Com- ew, who first extract the ore and coal from the bowels and then carry the iron through all the intermediate til it is turned out in the form of stately merchantmen le men-of-war. Messrs. Richardson and Sons do not at y on mineral royalties, although they have their acqui- ntemplation; but in all other respects their works are mprehensive as those of the great Jarrow firm.

RTLEPOOL ENGINEERING WORKS first claim our atten- was here that the firm laid the foundations of its now usiness. First commenced as a joint-stock foundry by pool Ironworks Company, who failed in their speculation, s were acquired about twenty years ago by Mr. Richard- rly an engineer at Castle Eden). They have since then than doubled in size. The make of marine engines is the ture of the works. Messrs. Richardson and Sons carry on n shipbuilding establishment, in addition to the other f their business, and, of course, they make all their own ut, in addition to this, they accept and execute orders for s, and Tyne shipbuilders. At first the firm did very little of marine engines. Land and locomotive engines were e production, but as the Tees grew in reputation and in shipbuilding port the marine engine came to supersede The first engines of this description were turned out in were only of 30-horse power. Nearly all the marine en- e up to 1860 were on the "jet" principle, which after- e to be superseded by surface condensers, and latterly by und principle, which is now paramount in marine ar- Messrs. Richardson's engineering works have very lit- k of in the way of specialties. They have been built to time to suit the exigencies of a rapidly increasing ithout much regard to symmetry or architectural perfec- hey come short in point of equipment of many of the tablishments that are to be found on the Clyde. But the on the whole, well provided with the necessary mecha- iances, furnished for the most part by Messrs. Thomas d Co. of Johnstone, who have achieved quite a European for their excellence in shipbuilding tools. Of late the tput of engines has been at the rate of one pair per fort- l parts of the engines are made to gauges and templates, ow an understood rule among shipbuilders, and by which ny part is made to fit any other engine of the same class When an engine is completed it is tested with water and then taken to the Victoria Docks, where it is fitted ce. Attached to the engineering department there is a aining a number of heating furnaces and steam-hammers, crank shafts, propeller shafts, and other forgings neces- arine monster, are executed. The capacity of the forge r, so limited that when any peculiarly difficult or heavy quires to be executed it has to be sent elsewhere, to works dapted for the purpose. On the Clyde there are no forges n with either shipbuilding yards or engineering works, l separate and independent establishments.

ber of workmen employed in the engineering department Hartlepool Ironworks is about 500. There are, how- rds of other 600 employed in connection with the foun- is chiefly devoted to the manufacture of railway chairs, and sizes.

LLEABLE IRONWORKS are situated at West Hartlepool, miles from the shipbuilding and engineering works. the first works of their kind erected at Hartlepool, which sly been a place of little industrial importance, except hipping and shipbuilding were concerned. Founded years ago by the firm of Pile, Spence, and Co.—a limited ncern, which succumbed in the commercial crisis of 1866 Hartlepool Malleable Works were only about a third of ent extent when Messrs. Richardson became their pur- he latter firm did not begin actual operations in the ma- f finished iron until 1868; but during the four and a hat have elapsed since then they have made continuous and improvements upon the works, which are now equal superior to most, of their class in the North.

between a large open space of ground on one side and the branch of the North Eastern Railway on the other, these r altogether over 30 acres of ground—12 being appro- the malleable works, and 20 to the new blast furnaces ory appliances. Ship and boiler plates, and rails of all ns up to 84 lb., are the chief products. Covered with ubstantial iron roofing, the puddling mill furnaces are o parallel rows, running the entire length of the works. lling department there are 116 furnaces. The rail mill her 21 furnaces, including 16 for heating and 5 for re- poses. In the "pulling over" plate mill there are six rnaces, all of the usual reverberatory type. There are trains, of large size, actuated by horizontal direct-acting which, as to the other engines on the premises, steam is 40 boilers, of the usual horizontal kind. In these boil- m is raised by the surplus heat from the puddling and e, thus effecting a great economy of fuel; and this, it be added, is a highly important consideration to a firm o into the open market and purchase all their fuel at market price. There are many firms still in the Cleve- who, perhaps because they are more favourably situ- ed to their fuel supplies, disregard this simple but highly effective means of economy, allowing the surplus heat from the puddling furnaces to go to waste.

Approaching the northernmost extremity of the works, we arrive at the Spencer converter, the most interesting feature of the establishment. This huge machine has now been in regular use at these works for something like a year, and its results have uniformly been the same—regular, unvarying, and satisfactory. It is of rhomboidal form, and has thus a manifest advantage over the Danks mechanical puddler, which being of circular shape does not give the same scope for the continuous motion of the molten mass under treatment. On a very recent occasion the Spencer converter produced 26 cwt. of best iron—including both puddling and hammering—in the short space of 43 minutes; and it is not at all an unusual thing to attain a weekly yield of 100 tons, or a production equal to that of not a few blast furnaces still at work in Scotland and Wales. Blast is admitted through a grate at the end of the furnace, and access is easily obtained to the body of the converter by lifting up the chimney, which is a moveable appendage, the molten mass being then removed by crane-power. The usual size of the balls taken from a common puddling furnace is not more than 1½ cwt., but the balls in the Spencer converter are 3 to 4 cwts. each, and the arrangements made for their treatment under the hammer are so perfect that no difficulty occurs in their manipulation. For fettling purposes Mr. Spencer uses mill tap, or cinder, in its liquid state; but he is now making experiments with the dry oxide bottoms patented by Messrs. Greener and Ellis, and from which he expects the most favourable results. Messrs. Richardson and Sons are so satisfied of the superior virtues of the Spencer converter that they are now making provision for erecting a row of six more, parallel with the one now in use. This project would have been carried out before this time but for the fact that Mr. Spencer is still without a proper equivalent to the Danks squeezer for shingling the iron after it is taken from the furnace. A hammer is now in course of construction which promises to make the apparatus complete. It is intended by the use of this hammer to strike in four different directions at once, thus bringing the fiery mass under immediate control, and enabling the ironmaster to dispense altogether with the aid of skilled workmen for shingling purposes. If Mr. Spencer's expectations are realised to this extent his invention will prove to be an incalculable boon, not only to the ironworker, whose labour it will so materially lighten, but to the ironmasters as well, for it will lead to an economy that cannot yet be adequately appreciated. Indeed, it is no visionary hope that the Spencer plant intended to be erected at these works will, when complete, enable the proprietors to produce the same quantity and a better quality of work with 200 or 300 less workmen, to say nothing of the reduction in wages that will inevitably accrue from the employment on a larger scale of unskilled hands. It is calculated, taking everything into account, that a single Spencer converter will convert as much iron in a given time as ten ordinary puddling furnaces. The average earnings of puddlers employed at these works, with their underhands, is about 3*l.* 5*s.* per week; shinglers earn 4*l.* 15*s.*; plate mill heaters, 2*l.* 15*s.* to 3*l.* 12*s.*; rail and plate mill rollers, 6*l.* to 9*l.*; rail mill heaters, 2*l.* to 4*l.*; and fettlers from 1*l.* 10*s.* to 2*l.* per week. The average weekly production of finished iron is about 1000 tons, more than three-fourths of this quantity being plates. Altogether there are about 2000 hands employed, and the weekly pay-bill is often over 2500*l.*

THE BLAST FURNACES, three in number, are just in course of being completed, and will be blown in very shortly. They are each 70 ft. in height, and 22 ft. diameter at the boshes. In carrying out this new undertaking the Messrs. Richardson have studied every known improvement in blast furnace architecture and practice. The blast furnace department will be carried on in close contiguity to the finished ironworks, and it is expected that the great bulk of crude iron made will be used on the spot, Messrs. Richardson having consumed no less than 70,000 tons of pig-iron for last year alone, while the extensions they have in contemplation will enable them to absorb a still larger quantity of the crude material.

MINING PROFITS.

There is a class of men who inveigh against mining. But where would the world have been without its mines of tin, copper, lead, iron, silver, gold, &c.? Where would England have been without her iron, coal, &c.? Where would the human race have been and its boasted civilisation had not the mineral wealth of the earth been developed by an enterprising class of mining men?

Mining is a high and noble calling, and one in which wealth is created and not extorted from a previous possessor. Let us look at the history of mining profits during the past year (1872) in England, and a useful lesson may be learned. The total dividends paid by mining companies organised in England was 955,620*l.* Now, of this amount 354,138*l.* was paid by British mines, and 601,482*l.* was paid by foreign mines organised in England. Here, again, we have an answer to the hortatory exhortations which are so lustily ejaculated into the public ear, such as—"Do not invest in foreign mines!" "Home mines alone pay!" &c., when the figures above prove that foreign mines have paid about twice as much as British mines, into English pockets, during the past year.

But let us look again into the elements which make up this sum of 601,482*l.*, which has been paid by foreign mines, and we find that West American mines have paid the majority of this amount—viz., the sum of 310,133*l.*—while all the rest of the world has yielded in mining dividends in England only 291,349*l.* It will thus be seen that the mines located upon the West Coast of the United States (often called Pacific Coast mines) have yielded very largely. It is also to be borne in mind that they are only in their infancy, only organised within the last two or three years, and most of them in their incipient stage of development—sinking shafts, opening tunnels, and simply doing their preliminary work, to be followed by greatly increased returns hereafter, beyond any reasonable doubt. These much-abused American mines have yielded nearly as much as the old and famous mines of England, and more than all the rest of the world beside, so far as English organisations show.

In view of these facts, why is it that men are constantly met who denounce American mines? The answer is twofold:—1st, on account of errors in the organisation of three or four silver mines; 2d, because they do not enquire, but allow prejudiced publications to manufacture their opinions. One would think a young and growing industry that had paid into English coffers 310,133*l.*, in dividends, in the year 1872, would be deemed worthy of fostering care at the hands of the shrewdest commercial nation in the world rather than reproach. And it is to be carefully observed that the above statements are founded solely on the dividends paid by the mines organised in England; if you add to these the millions paid to American stockholders in their American mining companies, the argument becomes overwhelming. Allow me to repeat the figures:—

Dividends paid in 1872 *on mines organised in England.*

Total		£955,620
FIRST SUBDIVISION.—British mines	£354,138	
Foreign mines	601,482 =	£955,620
SECOND SUBDIVISION.—Foreign mines, not American	£291,349	
Foreign mines, American	310,133 =	£601,482

ANGLO-AMERICAN.

COLLIERY WORKING—THE HERMON PRIZES.

SIR,—The announcement made in last week's Journal of the names of the successful competitors for the prizes offered by Mr. Hermon, M.P., and of those of the adjudicators, appears to have created considerable surprise to a great many of the competitors, who are mere working colliers, and who, for the first time in their lives, were induced to try their hand at essay writing. Exception is evidently not so much taken to those who have been considered deserving of the leading places in the very interesting contest as to the fact that with regard to the most difficult problems connected with the safe working of mines, and which have taxed to the utmost—and not always with success, as the records of our many terrible explosions abundantly testify—the skill of the ablest mining engineers in the kingdom, three members of the bar should be called in to act as experts, to decide upon matters and opinions that in all probability would puzzle the ablest and best-trained practical men connected with the management of our mines. To suppose that Mr. T. Hughes, M.P., Mr. S. Hill, M.P., and Mr. Rupert Kettle, all men of acknowledged ability in the profession to which they belong, know anything of the practical working of collieries—the systems of ventilation by natural or mechanical means, would simply be absurd. Such being the case, their decision is not looked upon with favour, and can certainly carry no weight—probably not so much as that of a practical collier. This will be admitted not only by mining engineers, miners, and the outside public, but cannot fail to strike the minds of the three gentlemen themselves who undertook the onerous task of judges, for it is evident that legal training, with education and general knowledge, however brilliant, in no way fits a man for speaking as an authority or of giving an opinion as to the best system of working mines, or preventing accidents by explosions. Neither Westminster Hall nor yet the House of Commons are exactly the places anyone would consider to be the best adapted for obtaining a knowledge of coal mining in all its details. Not a few of the writers are to be sympathised with at having been invited to write on a practical and scientific subject, and then to have their productions judged by gentlemen who were ignorant of all that related to it. Judges, as a rule, are supposed to be thoroughly acquainted with what they have to adjudicate upon, and to be superior in knowledge of the particular matter they have to decide to those who are engaged as actual competitors. But who will say that any of the three gentlemen appointed to award the prizes are equal even to Mr. Hopkins and Mr. Emerson Bainbridge, who may be said to have obtained the third and fourth places only, or even to the least competent of the three or four hundred persons who entered the lists in mining knowledge?

It will be recollected that the adjudicators, in the first instance, included Mr. F. Wardell, the Government Inspector of Mines for Yorkshire, and a gentleman holding a similar position, if I mistake not, in Lancashire. The decision of either of those gentlemen would alone have been accepted as satisfactory, whilst that of those who really undertook the responsibility cannot but produce a feeling of the greatest dissatisfaction amongst those who were at the trouble of writing most of the essays. Another point worthy of consideration is whether the proposals in the prize essays are original, and at the same time practical, and such as can be easily and readily adopted in an ordinary colliery, and if the adjudicators assert that such is the case. It may be some little satisfaction to many of the writers who have been unsuccessful to be informed that the opinion of a well-known mining engineer, who has the charge of several collieries, and was allowed to look over the five or six of the selected essays considered to be the best, did not coincide with the award made, for he is known to have given the preference to two—one by a mining engineer of Sheffield, and to a writer connected with an association in South Yorkshire.

It is certainly to be regretted that so much dissatisfaction has been caused by the appointing of non-practical men as judges, instead of obtaining the services of some leading professional engineer. Nothing, however, now remains but to await the publication of the prize essays, as well as some others, when their actual value will be guaged by the test of practical experience and mining knowledge. It will then be seen whether the judges erred or not. In any case, no doubt, Mr. Hermon will be only too glad to see any omission rectified, if such can be done, and it is sincerely to be hoped that he will by his handsome gifts have succeeded in giving increased safety to the miner whilst following his dark and dangerous employment.

SCRUTATOR.

COLLIERY ACCIDENTS—THE HERMON PRIZES.

SIR,—I find that one of the successful essayists, "Eloin," is a mining engineer, and was much surprised that a gentleman in that position should have been amongst the competitors. Now, if mining engineers desire to compete for money why do they not do so with those of their own class, instead of descending to measuring their strength with the working miner or deputy? That the award made is most unsatisfactory is admitted on all sides, seeing that those who made it understood nothing whatever of mining. Such being the case, I think we ought to demand that the Essays should be printed, and so bring out the relative merits of all of them. I do not care anything about the money, but I cannot but condemn the meanness of one or two mining engineers in putting themselves in competition with mere practical miners. I would propose that the essays

being printed, such men as Mr. Woodhouse, Mr. Elliot, and one or two others, should be requested to examine them, and state which were the best. The needy engineers should have the money undisputed. As the matter from the first was a working man's affair, it ought not to be lost sight of. I am quite willing to bear my share of the necessary expense. —— ONE OF THE ESSAYISTS.

THE HERMON PRIZES.

SIR,—As there is a general impression that the competition was to be confined to practical miners only, perhaps Mr. Hermon, or some person for him, would kindly state the number of writers, and the position they occupy. It is said there are more than 300 practical miners to two or three mining engineers. The truth could do no harm, for had it been known that the prizes would be open to all more mining engineers would have entered, and most probably no colliers at all. —— ESSAY WRITER.

WINDMILLS FOR MINES.

SIR,—The recommendation of Mr. Ralph Goldsworthy and others, to introduce windmills as a substitute for steam-power in the working of Cornish mines, is one which from time to time I have myself made in the *Mining Journal* for the last 20 years, and now that coals have become so costly I trust that some attention will be paid to the suggestion. It has been so frequently stated that the working of the mills in Holland is very economic, that further reference to the fact is unnecessary, and I believe that if some energetic Cornish manufacturer were to take the matter up there is an ample field for realising a fortune, for, as I have often suggested, the Dutch mills would not be altogether applicable for mining purposes; a specially designed mill would be necessary, and by patenting this the manufacturer could secure himself a fair return for his outlay.

To secure the introduction of windmills it is desirable that the difference of cost per horse-power per year should be given, the same allowance being made for interest on the price paid for the respective machines in the first instance. It would also be well if the first cost of a steam-engine, equal to 100-horse power (indicated), were given, and compared with that of a windmill of the same power. These facts have never, that I am aware of, been published; and if some of your correspondents were to make the necessary calculations and give your readers the benefit of them, I am sure they would be appreciated.—*June* 17. —— M. E.

NEW MOTOR.

SIR,—It appears by the Journal of Saturday that Mr. B. V. Benquet, Buzet, France, has invented a machine which he proposes to actuate by means of a succession of weights dropped in the receptacles of a wheel formed somewhat like a water-wheel. But the question arises—how, when once down, are they to be again elevated for renewed action? The history of this antiquated mechanical fallacy will be found fully described and illustrated in Dirck's "Perpetuum Mobile;" or search for self-motive power. It is curious to observe how this class of would-be inventors work in a circle, like a horse in a mill, without ever becoming conscious of the absurdity of their having made no progress, whatever may be their labour and expense. Where they began there they leave off, and after years of toil are still ready to start afresh in their profitless and endless toil.

AN ANTI-PERPETUAL MOTIONIST.

SUBSTITUTES FOR COAL—CRETACEOUS FUEL.

SIR,—It is rather curious that two gentlemen's inventions—the one being Mr. Mitchell's, of Millbank-street, Westminster, the other that of Mr. Leon Gaillordt, of St. Petersburg—should, in last week's *Mining Journal*, have been referred to in the same paragraph, although they are virtually identical, the essential feature in each being the combination of cretaceous material with coal or other similar fuel. The practicability of the inventions has, of course, to be tested, but that they are very plausible there can be no doubt. The enormous heat generated in a lime-kiln is well known to most of us, yet the quantity of coal used in lime burning is comparatively small—a bushel of coal converting from 3 to 5 bushels of chalk into lime; but the great question is how to utilise this heat either for the generation of steam or for other purposes. I am not aware that either the covering or encircling of a lime-kiln with a steam-boiler has been practically tried, although I believe it has more than once been proposed; it would be very interesting to learn the result of a practical trial.

As to the combination of cretaceous or calcareous matter with coal to form an artificial fuel, there is the satisfactory circumstance that the addition of a very small quantity proved highly satisfactory. An inventor, whose name I do not at the moment recollect, but I saw the invention tested somewhere at Camberwell, proposed the agglomeration of small coal and coke breeze by wetting it with a thick milk of lime, and the advantage was that no compression whatever was necessary. When the mass was nearly dry—it having been carefully spread in a frame, that it might dry of regular thickness—the side boards were removed, and it was divided into about 8-inch squares, so that the lumps were about 8 in. square by 5 in. or 6 in. thick. The fire was got up in the ordinary way in the morning with coal, and for the remainder of the day the lumps were the only fuel used. These lumps were quite clean to handle, and were thrown into the furnace one by one when required, care being taken to break them as little as possible, and to throw them so that there should be a good draught between them. As the inventor was his own stoker this presented no difficulty, and a ton of lumps had not made more than half a shovelful of dust, which was scattered over the fire when it was in good condition.

The general character of the lumps was much like very tender coke, and it seemed to me that no ordinary workman would be at all likely to handle the fuel with such extreme care, whilst the reduction of the lumps to powder would have been fatal to success. The steam, however, was well kept up in this case, and upon trying some of the fuel in an ordinary grate I found it burn well, and give a good heat; but there was a good deal of white ash—I presume the calcined lime. It is essential to success that there should be a good coal fire before any of the fuel is used, and that in using the fuel it should be carefully put on with the hand, so as to leave plenty of ventilation; it must not be touched with the poker, and if the fire be permitted to run too low it is best to refresh it with a sprinkle of coal. The fire made is a very cheerful though somewhat dirty one, and if the inventors mentioned have discovered the means of making a hard fuel which will not fall to powder, and at the same time one which is as readily combustible as that I have referred to, they have a good prospect of bringing it into general use.

Limehouse, June 17. —— L. K.

LEAD MINING, AND LEAD DRESSING.

SIR,—I am much pleased to notice weekly, in your valuable Journal, the evident fair play you allow your numerous correspondents to treat *pro* and *con* the various subjects relating to mines and mining in all its branches; and not least among the variety of matters discussed therein is the dressing of lead and other ores, a subject which up to a very recent period was considered a secondary matter in mining, but which is nevertheless a very important one in our national industry. What prompted me to a great extent to trouble you with these remarks was my reading, in your columns, the report of Capt. J. Williams, of the Cwm Elan Mine, of which he is the manager—more especially to that part of it in which he says:—"We have a large pile of lead and blende ore ready crushed and jigged, we cannot make it marketable until we get the 16-ft. wheel from Mr. Taylor." Now, Mr. Editor, I am totally ignorant of the kind of machinery they have at Cwm Elan for dressing their ores, but I am inclined to think that it is the old system; and it seems to me that Capt. Williams, like all other thoughtful managers, is very desirous of the produce of his mine being sent to market with the greatest dispatch possible. For his benefit, and also for the benefit of others similarly situated, I would call their attention to the Patent Self-Acting Mineral Dressing Machine Company's system of dressing lead and other ores, which, had they been in use at the Cwm Elan Mine, would have had the major part of their produce made marketable exactly in the same time that it took them to bring it to the state in which it is now in, had it gone through the above company's jiggers. The classification of stuff by the above company's process is perfect, the water that flows from the jiggers being so bright and clear that even the most fastidious housewife in the kingdom would not object to use it (as far as its colour goes) to prepare for her better half the "cup that cheers but not inebriates." And from what I have seen of the work that this system of dressing does, they only require to be more generally known to be adopted in every mine. Being altogether self-acting they save an enormous amount of manual labour—a commodity which can only be had for a very high price these days. —— PRO BONO PUBLICO.

TIN MINING, AND TIN DRESSING.

SIR,—I have been a reader of the *Mining Journal* for a great many years, and have watched with much interest the letters published therein, from time to time, by your different correspondents, on various subjects, and I have been very much interested, and sometimes amused, while reading the letters on Tin Dressing—from Capt. Parkyn, "Mine Agent," "Plumbum Album," and Mr. Ennor. I do not enter this field of controversy in a spirit of antagonism to either of the above gentlemen, but as the subject on which they are writing is a very important one, especially so to the county of Cornwall, I beg respectfully to suggest to them that they confine themselves more to the principle of tin dressing, and less to personalities, and give the public the benefit of their information upon such a momentous question.

We must all acknowledge that tin dressing is a question which affects, more or less, every mining district throughout the county, and as the writers referred to seem to represent a large portion of the county—for I find Capt. Parkyn at St. Austell, "Mine Agent" at Camborne, Mr. Ennor from Wadebridge, and, perhaps, "Plumbum Album" is from some equally distant part of the county—if so, then surely something ought to have been advanced in this correspondence more advantageous to the mining community generally, and, Sir, an interchange of thought from different districts ought certainly to lead to good results.

There is no doubt but great improvements might still be introduced both at the mines in the St. Austell and Camborne districts, and, perhaps, other places throughout the county, and if my information be correct, I do not see how Capt. Parkyn can very well appropriate the term Parkyn's Save-All Dressing Floors to what he claims as his improved floors, unless he dresses his slime instead of allowing it to wash out of the mine, and pays no attention to it, as is now the case. I do not wish to cast any slur on Capt. Parkyn or his improved method of dressing tin, if it may be called such, which I question, for I have been credibly informed that in neither of the mines in the St. Austell district is there any attention paid to slime tin. If this is true, then what a pity for the suffering adventurers in such mines? Why, if the same carelessness was manifested by the agents of the mines on the Red River, which Capt. Parkyn and Mr. Ennor have been pleased to refer to so often in their correspondence, instead of hearing of about 40 tons of tin being wasted per month we should hear of 200 tons per month, and I believe that number of tons would be nearer the mark. As a rule, slime tin is considered to be from 15 to 20 per cent. of all the tin raised, of course some lodes contain more iron than others, and require to be stamped finer, and, consequently, will make a great deal more slime—hence the difference in the percentage of slime tin.

Anyone conversant with tin dressing, and knowing anything of the county generally, must honestly acknowledge that the system, as a science, is brought nearer perfection in Camborne district than any other place throughout the whole county; but I am afraid that too many of the tin dressing and other agents in that neighbourhood, and I must confess it, belonging to some of the most important mines there, are said to have large shares with the squatters on the Red River, reserving to themselves the management of such works, and at the same time receiving their regular pay from the mines they are engaged in. Sir, I think the time is come when the adventurers of those mines bordering on that stream should take the matter into their own hands, and question those agents, at their mine meetings, as to their relationship with the squatters on the Red River; and, if it is found to be as stated, then active measures ought at once to be taken to purge the mines of such men, or else request them respectfully to give up their relationship with such a questionable proprietorship. I think it would be a dark page in the history of Cornwall if some future historian should have to record that the squatters of the Red River and mine agents are identically the same, and had the management of those mines above that emptied their refuse into this celebrated river. OBSERVER.

June 16.

TIN MINING AND TIN DRESSING.

SIR,—In replying to Mr. Parkyn's latest effusion I shall begin by stating that he need not have troubled himself to inform your readers that he is the author of those letters which recently appeared in the Supplement to the *Mining Journal* with his name affixed, as no one, I am fully convinced, would ever think of ascribing the authorship to anyone else. They appear to me to be remarkable for nothing so much as a temerity which could only proceed from a condition of mind which, to avoid personalities, shall in this connection be nameless. To this condition of mind must also, I think, be attributed the compliment he has unwittingly paid to yourself, Sir. "I do not believe," he said, speaking of me, "that he is a mine agent." I have styled myself as such, and you, Sir, have endorsed me. The columns of the *Mining Journal* for years long ago will testify of my appointment to one mine after another, and to the testimony borne from time to time of my general efficiency in mine management.

When in discussing the various mining questions which you have from time to time allowed me to bring before the public in the columns of the Journal, with my name in full attached, exceptions have sometimes been anonymously taken to the views I have expressed; but it never occurred to me to imperiously demand who the writer or writers were. I always regarded it as immaterial to me who or what they were. My concern was with the measures, not with the men. I have always satisfied myself with the reflection that if you, Sir, thought proper to admit them to the columns of the *Mining Journal*, that, however much I might have wished it otherwise, it did not become me to question, by rude and impertinent interrogations, the propriety of your acts nor the soundness of your discretion. * * * * Comparing things of the present with things of the past, with the weight of their prejudices thrown into the balance opposed to all progress, whose settled conviction is that the higher class of mental culture unfits men for the discharge of life's ordinary duties, and whose ignorance would degrade everything to its own level; for in speaking of others themselves individually are invariably erected as standards of comparison—"I am so and so," "I do so and so"—just as if they possessed the most absolute assurance that they were the highest types of human excellence, and as if everything that was noble, magnanimous, and elevated were formed after their model. Men with one idea ought never to be dubbed empty-headed, for they are generally more full than those who possess a thousand ideas upon a thousand different subjects, and are much more difficult to convince, because they see nothing else, nor can see, but ever and anon, like Mr. Parkyn, return to and revolve around that one idea, as a little light in an otherwise densely dark place.

The gentleman declines to submit for investigation those statements which he voluntarily made in the columns of the *Mining Journal*, and, in retreating with his back towards his foe, presents a ludicrous aspect by exclaiming—"Why don't he meet me," &c.; "Why don't he say something about the number of holes in stamps grates," &c. This he urges, I presume, because I stated on one occasion that there was no controversy with me about them, and, also, he appears to have jumped to the conclusion from the same trivial circumstance that I am the person whom he accuses of using stamps grates having 88 holes to the inch instead of 25, which he states ought to have been used. Well, Sir, with your permission we will say something about stamping and stamps grates before we get through which I think will sufficiently show that, instead of setting himself up as a teacher of others, he has something to learn in that line also. As this letter is already so far advanced, and I desire to make a few more general remarks before concluding, I must pone the consideration of stamps grates to another week, and perusing which I hope the gentleman will be good enough to fa us with his views on the subject. He has already informed readers that his object in writing was to inform mine adventu and protect their interests, and this, I beg also to say, is my object. It may seem strange to some persons that two individ pursuing the same object should take diametrically opposite co to accomplish it, but then one thing should be borne in mind, neither offering my services or my productions to the public change for their money.

And now a word in reference to the gentleman's dexterity muddler. "As to the remark," he says, "of taking 1 lb. of tin the tin-hutch and pulverising it a second time with the slime." And then he adds, "who would ever think to mix up 1 lb. of with slime and put it back in the tin-hutch again?" I propose experiment for the purpose of convincing him, if possible, of absurdity of his pretensions in regard to tin dressing. My pro tion was not to mix the tin with slime, nor with anything el water, and to be exposed to no liability to loss from leakag being handled in insecure vessels, as nothing but the finest porce were to be used; and I affirmed that during the repetition of cess and corresponding number of changes to that incident to dressing, and the decomposing action of water, to whose influe it would have to be subjected for days, and sometimes for we together, the 1 lb. of tin at the expiration of the process would found to be sensibly diminished. I did not ask, as that fossil individual, who refers everything backwards, seems to have posed that I did, "Who ever heard of such a proposition before?" The proposition was designed to meet an exceptionally assum case, and things, it may be necessary to inform him, which never heard of before are just those things which are new, and note progress. I put the most palpable case before him, for the pose of convincing him and others that his pretensions in respe tin dressing were based on gross assumptions, and not on fa but, true to his instincts and education, his mind reverts; instan backwards his gaze is directed, the future to him is impenetra an inconcivable incognito.

Once more he charges me with inconsistency from having said I had examined the plan of his dressing-floors, which was published in the Journal; and in my last letter for saying I had seen his dressing-floors in operation. I am, therefore, inconsis because he has muddled and confounded things essentially differ *Apropos* of inconsistency, has Mr. Parkyn forgotten that he in the *Mining Journal* of May 31, that agents like him had t their breakfast before they could eat it, by extracting their tin poorer stuff than that thrown away at the mines bordering the River? Let me now ask him to explain how he reconciles that st ment with the general tenor of his reports of the mines under management. Have the terms "lode very large," "very r "rocks of tin," &c., a very different meaning when made use of him than when made use of by others? And notably (see report Wheal Mary in *Mining Journal* of May 17):—"Lode 18 inches wi more than half solid tin!" What does this mean? Can the ind vidual by any possibility know what he is writing about? 18 inches wide, more than half solid tin—4 tons of black tin to fathom, or upwards of 300*l.* in money value; and in two weeks a this statement was given to the public in an official report in Journal, we are informed through the same medium, and by the sa individual, that he has to earn his bread in the sweat of his face extricating tin for the market from poorer stuff than the life-l tin dressers of the mines of West Cornwall know how to treat.

MINE AGENT.

ON TIN MINING, AND TIN DRESSING.

SIR,—In reply to Capt. Wm. Tregay, I am rather surprised at remarks; he says mine are rash expressions as to the Red River, the tin sent to the sea beach, and that I should have gone there test it. Surely Capt. Tregay must know it is not my business waste my time in looking after other people's tin, when the mi owners pay agents to keep it at home. I only showed that going there, and it is the duty of paid agents to look after their tin; my remark was only used as a caution to him and all it might concern. Then he censures what I said as to Drakewalls; I rent to tell him I have it in black and white from an authority equal himself, before I had it printed and published, and if he loo through the Journal of June 7 he will there see the authority of Duchy officers, and Capt. Quentrall, Capt. Teague, and others; t why question my veracity with regard to the mine that lost 100,0 I looked for no proof; if I called at his mine, and he had told his next neighbour had thrown away 100,000*l.* worth of tin in t rivers, what would be thought of my doubting his assertion? thought my informant respectable, and I took it for granted: but put the question to a second agent, not telling him the mine, and said at once, "I know where that is," and named the same mine but it so happened that I had to report on this very mine. I went there, and I said not a word about the 100,000*l.* loss. I asked if there was not a quantity of tin left on the refuse, and I was told they left an immense quantity, but it had been nearly all taken away. I said not a word at the mine of such a thing, I could only divulge that to my employer; but it will come out in due time, if is not done with yet. Then, I have to remark that I did not go to the foundry in search of his mine's tin; I did not even know the water ran there; but I never was more surprised than to find what should have been a garden, or a valuable room for the foundry, full of frames. I ask the question, would they so use it if it would not pay well? and what pays them would surely pay you at the mine, but you slip over this in your letter without a notice. Again, as to your refuse going into an old shaft, and into Sparnon adit. I was informed so by a man of your town, much older than yourself. But the most amusing part was a man saying he would put up a frame in his back kitchen shortly to catch the tin. Then it was very natural for me to ask where the tin came from—I had no knowledge of it, I frankly told you so, the only interest I felt in it was that I thought tin was stamped far too low. I may here notice that one of Nature's laws is that any substance reduced to atoms will swim; stamp tin to atoms and they are invisible, and will swim to the sea.

I might carry this still further, and say that millions in value of tin have in time past been carried to sea, and the best of our agents were not aware of it; I think far more so of late years, since the mines have got into the habit of using the large heads. My object in noticing these things was to call the attention of all those concerned to see who could find the best remedy to retain it. Where is the man who would support a waste of tin as is proved to have taken place at Drakewalls Mine? I worked there for years, and dressed my own tin, and no doubt threw away a portion. I do not blame the man in charge so much as I do the public, as I am inclined to believe he is like most others, and did not know it, but this may ooze out by letters.—*Wadebridge.* N. ENNOR.

LEAD MINING IN WALES.

SIR,—Surely you will allow me to reply to the letter you inserted last week from my old friend, Mr. Francis. I am pleased to see him take the subject up; he certainly was a little harsh in his expressions, but I am ever ready and willing to lift a blind man out of the mire, and to tell him to be more careful next time. I only wrote what I thought, and what I think I can prove. Having nonced ever since the Van Mine has shown a pleasing face that someone had taken the position of band-master, carrying the Welsh horn that reaches even the London Exchange, telling all those inclined to invest that there is nothing like Welsh mines. He is ever telling them "it is certain to make them all Sir Hugh Myddeltons if they engage largely;" this tickles the ears of many, and even sweetens their thoughts. I will not say here what I think of the class of men who are caught by the sound of the horn, but I may say that I have surely known Wales for over 40 years, and I did say that but very few of the lead mining companies have ever paid a dividend; and to prove this I refer to the Journal list, where they manage to keep about six mines in; and it may do Welshmen a service to tell them why. First, then, I tell them that the Welsh clay-slate rock is con-

mial to the growth of lead, but the country is very deficient of ross lodes, caunters, and change of strata, and the lodes want more intersections. I will undertake to say to him that every paying mine they have had in Wales in the clay-slate is at intersections; our continuous lodes may at times show good lead, but they make paying mines. Let the advocates of Welsh mines tell their friends openly that you have been hitherto working wrong on these old ingle lodes, and that you will take Ennor's advice, to set about at once to find all the intersections, and work them only, and then you ould have, as they have in Cornwall, one paying mine out of ten. ell you openly you have in Wales intersections enough to do this how the fortunate holders in good mines would smile upon you. you go the right way to work, and find them; it looks so odd for man to be blowing the noisy horn all his life, and repeating the ds of what Sir Hugh did; it seems so strange that he should find ad mines, when you never could find one for yourself or friends. re you to do so, just look at the difference in your own position; I know many men who go reporting, who openly say they never , nor they never would, give a bad report of a mine; and others y. If I do not give a good report I shall never get paid. These men ver found a paying mine in their lives, but they are brokers' men, d often get work inspecting mines, many of them sign reports ritten for them. I say to those who would speculate in mines, ver join a party who shows a report from a man who never found paying mine, nor a man who had been captain, if he had not found e; it says but little for a man if he never found one, they are nerally only useful tools for brokers, but they are a curse on ining. I am now pressed for time, but I hope Welshmen will take dvice, as I think it is sound. N. ENNOR.

Wadebridge.

THARSIS COPPER AND SULPHUR MINE, SPAIN.

SIR,—I was much pleased to see (in the Supplement to the *Mining Journal* of May 24) the article on the Tharsis Mine. I examined e property when in Spain, many years since, and found the French rkers civil and kind. They were working the mines better than o or three English parties there were working theirs. I exa ined the mines very closely, and could not find one that any recent rkers had found the bottom of,—old works, which had not been ought since the time when Columbus discovered America, when ts and shafts were all stopped up, to drive the miners to America work the mines there, and never opened until taken by the pre nt parties. I wish that your article had been more explanatory. hen I saw the mine the lode was nearly whole to surface, and m 60 to 100 ft. wide—a mass of sulphur, and a little copper, with t much dip: it ran obliquely to the rock, a clay-slate near on its e. The mine might certainly be called an extensive working, ut there were many shafts, but it did not appear ever to have been ought extensively as an open working. The sulphur cropped up within 20 or 30 ft. of the surface, where the best portion con ributed from 3 to 5 per cent. of copper, but not much worked. They olded one of their deepest levels while I was there—that is to say, crossed a shaft, and they dropped into water 22 yards deep. hey were constantly crossing old deep shafts. I found this to be e case in every sulphur mine I have been in: none had found bot m. There certainly was a quantity of old slag on all the mines I w, but I was at a loss to discover what the ancients worked for. saw no place where they had precipitated the ore. If they did so, was all destroyed.

When I was there they were roasting the poor ore in heaps, and precipitating it for copper; the better portions they were sending England. I expect they will do so now until they can get a rail ay constructed. From all I could see and gather from those upon e works, the ancients worked it more miner-like; they only se ected the most coppery portion to precipitate, the sulphur was oss to them. I do not think that they smelted in furnaces, as I w lumps of over a ton weight on some of the mines which ap eared to have been over-heated, and run the heaps into lumps. I ound the small portions in the heaps, if sifted through a 1-in. hole re, contained more copper than which they were then raising out f the mine. The ancients had gone deep in exploring the bottom, hich was miner-like in their day, and I came to the conclusion hat the ore was fast improving in depth. The old adage is that Hardic rides a good horse." This lode is a mass of sulphurous ntic, and I have not a doubt but that the mine is far richer for pper in its bottom than it is in the upper portions. I should not surprised if these mines should go into a mass of copper at and ter they get to 100 fms. deep. Were this my mine I would at nce erect a good steam-engine, and sink a shaft even to a 200 fm. el. The difference in the cost of working with a good drawing gine is but trifling. After they have a railway, and the mine is pened up miner-like, the whole mass from surface will pay for undreds of years to come—indeed, a hundred years has nothing to do with the durability of the mine. The upper portion can be ised and put into wagons at 1s. per ton, and I am confident that e copper will increase in depth. After the railway is complete hy not extract the sulphur on the spot, or at Huelva? Coals may be said to cost nothing for freight, it is only back cargo for ships o take out, and for the wagons to take on to the mines. I should ery much like to hear whether the copper is improving as the ines deepen, agreeably with my view. I venture to say it will ertainly do so.

I said the French owners took the lead for good management when I saw the mine, but they had no railroad, coal, or steam-engine: in fact, they laboured, I may say, under every disadvantage, and I am right glad they have succeeded, and brought the mine into a good pay ing state, and every mine on the run of this lode will pay well, if well laid out and well managed after. I had to quarrel with the manag ing agents at the English mines I visited. I never found a wheel barrow on one of them, either at surface or underground. They brought all out to the shaft that they broke from such massive lodes of from 50 to 100 ft. wide in grass-baskets, and hitched them on to a windlass rope, and when drawn up they were carried off to the heap and emptied.

At St. Domingo Mine, in Portugal, I also observed that they had a water-wheel with pumps and a whim on one shaft, but they would not use it; they said the bags were better. They had not a shovel on the mine, they had only short turnip-hoes to fill these bags underground and at surface. They loaded the mules, donkeys, and horses in the same way with grass-bags full of this ponderous ore; but they were making a railway, or tramway, a thing very much wanted out there. They want such roads as are used to take the slate to Port Madoc, only 2 ft. wide: it is said to be the best road in the world, and is to be made very cheaply. Such roads as this, with good machinery, and active and intelligent men to manage, are much wanted here. I know of no mining property like it. There the dues are only paid out of profits actually made, after deducting every expense. I would rather venture 100*l.* in this mine than 1*l.* in any of the silver mines in the Emma district. All that is wanted to carry out these mines, and to bring them into a paying condition, are cheap narrow-guage railways and good and efficient machinery, with active and intelligent men to conduct the work.

I said I had to quarrel with them in more than one mine. Just fancy a mine like the St. Domingo, with a lode they could raise ore from to any amount, being without a whim, barrow, or a shovel. They send 100,000 tons annually to the port on horses, mules, and donkeys in grass-bags, all the bags filled by the drivers, and hitched on to the saddles, filled with just such a thing as the girls use in England to clean the ranges and flues with. I may remark that I found one fair mine Captain at St. Domingo Mine, but he had no power to act.—*Wadebridge.* N. ENNOR.

A NEW DIRECTOR OF THE JERMYN-STREET INSTITUTE.

TO MR. NICHOLAS ENNOR.

SIR,—The public, who have been so much instructed and amused by the very numerous and luminous practical lessons which "from time to time and at all times" you have afforded them, should demonstrate their appreciation thereof more fully than they have hitherto done. You have come forward in the *Mining Journal* voluntarily, and for the benefit of the "young aspirants" have given them a variety of *practical* hints. Now, although you are happily above want of any place or pecuniary means, I propose that measures shall be taken to place you in the position for which your talents so eminently qualify you—and that is to the Directorship of the Jermyn street Institution, a post which, from your practical knowledge you can occupy for the benefit of the United Kingdom. Having attained to that position you will be able to displace all the un-practicals engaged on the Geological Survey, and appoint men "after your own heart." I have read the letters which you wrote a good while ago—and which I shall never forget—showing the incompetency of the late directors of that institution to fill that situation; and so sensible were they of the propriety of your criticisms that they did not dare to say one word in reply. They left the field, so to speak, in your possession. What clearer proof could there be than that of their sense of your superiority?

I propose, also, that all the titles usually bestowed on men eminent in science shall be conferred on you—not that you care much about them, but as a debt due from the nation to an eminent man.

Like eminent men in general, you have such a humble view of your own powers that I dare not say that you will accept the position referred to; but I beg that you will do so for the benefit of the world in general, and for that of "young aspirants" in particular.—*June* 10. S.

THE FUTURE OF CORNISH MINING.

SIR,—It must prove encouraging to the enterprising to learn from so high an authority as Capt. W. Teague—the practical manager of Carn Brea, Tincroft, Wheal Kitty, South Carn Brea, and Seton, five of the most important and profitable mines in Cornwall—that he believes in the future advancement and success of Cornish mining; that he is confident in circumstances arresting the tide of emigration, and the labour market cheapening—disappointment to those now in foreign countries will deter their comrades at home from following their example; that the supply of tin from abroad will be trifling, and not likely to materially augment for a series of years, while prices must advance at home; that machinery can be greatly improved, and the consumption of coal diminished; while the new school of miners will render many a dormant and inactive concern, now prostrate from lethargy and inanity, the arena of future industry, the hive of honest thrift, and of prospective and continued success. At all events, the change at Carn Brea under his supervision was marvellous: here was an old mine, worked for a number of years at the cost of all its products, with losses subscribed by the shareholders of 20,000*l.*, and the price of the entirety all but unsalable at 10,000*l.* to 15,000*l.*, when in an incredible short time he resuscitated the property, gave 14,000*l.* in dividends last year, and the public became eager buyers of the shares at 180,000*l.* for the mine. There can be no surprise in the public mind that the proprietors were grateful, and that his admirers—not of person, though that is fair enough, but of his mining skill and indomitable industry—presented him with a token of their regard and approval. Again "Seton" has arisen a very "Phœnix" from her ashes, and the first dividend (after six years suspension) was declared at the recent audit; while future yields will, in all likelihood, be sustained, reforms effected that will diminish consumption of fuel and economise cost of production, and, lastly, improvements effected facilitating locomotion and dressing of products.

At Tincroft Capt. Teague has astonished all his compeers, and none can compare with him in products and gains. Last year the dividends were 48,000*l.*, and at one time the property sold for the sum of 420,000*l.*, though at present it stands at 310,000*l.* only, yet the produce is equal to its best days, and only enhanced prices for tin—or rather the quotations of last year—are required to keep up the same profits. This mine will prove a bright meteor in commemoration of a new system in mining introduced by the gentleman referred to ages to come, and stand the precursor of heralding other stages of advancement, much needed, and which will greatly augment the gains of practical enterprise in Cornwall. With all their abilities, neither the long management of Mr. Stainsby, nor the capricious supervision of the late R. R. Micheli, or his follower, Mr. Francis Pryor, though in possession of rich deposits of copper, and excavating the shallow sections of the various lodes, with coal and labour at less than one moiety of present costs, could accomplish in the palmiest days of their prosperity more than one-third of the present management.

Of Kitty (St. Agnes) I can only again say that it is practical management—the new school, a system that can be advantageously carried out in many other undertakings—that sustained the dividends of 8590*l.* for 1872, and give vitality to the future. South Carn Brea gave 1875*l.* dividends last year, and shares are quoted 3*l.* 15s. per 1-5000th; ere the management was changed the price was 2s. 6d. to 5s. and the adventurers wholly disheartened, yet activity infused confidence, and a few months patience resuscitated the property, and calls were changed into dividends.

So much for the new "School of Mining." I should not have referred to Capt. Teague so especially had I not had an ulterior object in view, although, with others, I cannot but admire the skill and energy displayed by that gentleman throughout a long career of practical mining industry. To Mr. West, at Phœnix and other mines in the St. Austell district, the mining public are greatly indebted, both as an advanced engineer and miner.

Again, Capt. J. Burgan, of Helston, is a disciple of the modern school. His mining career sprung from the great mines of Gwennap, when the Messrs. Taylor and Williams swayed the sceptre of prosperous industry in that superlatively rich district. He also has had much experience in the Brazils and Portugal, and it was chiefly the carrying out of his plans and suggestions that led to the brilliant results at St. John del Rey. At home he is no less conspicuous for his success. The locality of Wendron is deeply indebted to him for its prosperous development, and especially the Lovels, a group of mines likely to yield largely to shareholders, and to lead to other successes, as for instance the Mangearne, which has a run of 600 fms. on the Lovel lode, now computed to be worth 200*l.* per fathom. In a conversation with Capt. Burgan recently he observed that it is not enough for agents to rest satisfied that their convictions are correct and their conduct unimpeachable. It is true that they may have done their duty, neither neglect nor lack of judgment discernable in the development of mines committed to their charge, yet there is still a mystery in their proceedings that destroys all confidence. Why not in their reports and proceedings at meetings of shareholders embrace the evil as well as the good points in possession and prospective?—*i.e.*, why should not mining pursuits be conducted like every other branch of native industry—the good and the bad equally dwelt upon? False hopes are as disastrous as morbid forebodings. Forewarned, the absentee shareholder could not plead ignorance of the breakers ahead, nor be so completely taken aback after the brilliant dividends of 1872, as in the cases at Trumpet Consols, Dolcoath, East Pool, and Cook's Kitchen. It is necessary to know the value of pioneer points, and to see a section of the workings and reserves at all times when the quarterly audits are held; then the absent shareholders would be kept alive as to the results. Again, stock-books of materials, machinery, and of ores discovered underground and standing in the different levels on the various lodes, should be studiously and accurately kept up. It is easy to diminish the stock of materials, and to lessen the reserves of ores, over a period of six or twelve months, in any mine of magnitude, and thus keep up, or even increase, the dividends, and yet no trace of the diminishment can be seen in the reports or accounts, as too frequently issued, of Cornish mines. It is absurd for mining agents to plead custom, or the risks of metallic deposits, to screen themselves from responsibility. They are either competent or otherwise, and they should discharge their duties as the managers of banks, insurance, railways, canals, buildings, and manufactories do; or they should be substituted by more efficient men. Every one of the businesses referred to are associated with hazards equally as is mining, yet, otherwise than in the case of the Devon Great Consols, we know of no mine company that regularly keep up a stock-book of the ores and assets appertaining to the adventurers.

As a rule Cornish agents cannot plead want of intelligence. It is, therefore, time, that the modern school of miners extinguish the prevailing prejudice, self-sufficiency, and arrogance, long descended from their ancestors, and which is a disgrace to the education and intellect of the south-west metallic peninsula of England. The motto of Cornwall, "One and All"—*i.e.*, fifteen balls—must be reversed, if capital is to flow westward from the metropolis. "Fair Play" must be "fourteen to one" that the chances of mining are secured to the absentee, instead of, as at present, "fourteen to one" that he is sacrificed from lack of accurate and detailed data and information as to the state and prospects of the mines in which he has invested his capital.

As the future of Cornish mining appears to practical authorities fraught with promise, may we ask why it is that Wheal Agar, East Pool, and South Crofty should so long be working on the backs of each other, and pay the shareholders nothing? For the last dividend at East Pool cannot be regarded as gains, when so large a debit remains in suspense. These mines in one concern, a fusion of interests in one fedral company, would pay at least 20,000*l.* a-year, while as at present conducted they may yield products of 70,000*l.* to 80,000*l.* a-year, and not pay a single legitimate dividend for the next two to five years. What is wanted here is amicable combination, lessened costs, and economised returns. The best works are under water, owing solely to distrust, obstinacy, and unproductive avarice. It is time that the new school of mining be introduced, if absent shareholders are to receive dividends on the capital invested. The working of these mines at present only benefits Cornwall—labourers, executives, merchants, and landlords. There surely could be life and soul infused into such mines as St. Ives Consols, Botallack, Providence, Margaret, North Crofty, and North Roskear. How many fathoms a-year have any of these mines been sunk during the past ten years? It is certainly an anomaly, when compared with any other industries throughout this country, that periods of 20 to 25 years should pass in the history of companies and no gains accrue to shareholders; but, on the contrary, periodical calls, and advantage to none but what is denominated the vested interests of Cornwall—landlords, merchants, executives, and employers. It is positively a fact that North Crofty and North Roskear have returned 400,000*l.* worth of copper and tin without 20s. gain to the shareholders; and pray who has had this money? Why, Cornwall. Surely the system that revived Seton might effect some good for these concerns. Again, St. Ives Consols, Botallack, Providence, and Margaret have drifted into the same position as Carn Brea before Capt. Teague took the management, infused soul into the workings, and changed revenue and expenditure from a deficit to regular surpluses (quarterly balances) for division amongst the proprietary. The new system of mining must be thoroughly adopted throughout Cornwall, and then enhanced success will attend mining pursuits. It is of no use to mine solely for the vested interests of Cornwall. The vested interests of shareholders are dividends on capital.

The Cornish miner seeks his individual welfare through emigration, without the slightest regard for his late employer; the merchant advances his charges for coal to 22s slack and 30s. per cwt. ordinary best. Common iron 16*l.* to 18*l.* per ton, and cast or blister steel to 64*l.* per ton, and exacts payment through the terror of that "scourge of the land" the Stannary Court. The landlord exacts his dues with singular cupidity and reckless indifference to the necessities and exigences of the shareholders; while in many instances the agents are wholly indifferent to the profits of shareholders, so long as revenue meets cost of production, and, consequently, the vested interests of the county preserved. It is, therefore, incumbent on all managers to look solely at the welfare of shareholders. Labourers, merchants, and landlords must of a necessity be advantaged. Still, in the conduct of the various mining enterprises of a public character, and dealt in upon the London market, all but the shareholders themselves must be discarded from consideration. Did anyone ever hear of a contractor of a railway, canal, or dock having in his estimate of costs any consideration for the vested interests of the locality in which they are situate? Or did anyone in Cornwall ever come into Middlesex and work a brick field for a quarter of a century without gains to himself, but, on the contrary, occasional calls, and solely for the advantage of that already favoured county?

Cornwall is unquestionably the richest mineral field in the known world, but there is more prejudice, self-will, and reckless obstinacy still existing in that otherwise intelligent county than can be met with in any other district throughout England. May these abuses be redressed; then we shall have more gains out of Cornish mines than from all the deposits said to exist in Australia, America, Canada, and the Cape put together.

Drakewalls is again a valuable property: 200 years working leaves this mine a comparatively shallow one. The operations will require the skill and energy of the modern school to infuse vitality into the future. Practical energy and economy are all that are required to ensure success. East Basset has passed into the hands of Mr. Richard Pryor, who promises great results. He stands pledged to achieve great reforms, and he plainly informs shareholders that he requires time and money. St. Agnes Consols is opening out satisfactorily, and will soon become an accomplished success. East Balleswidden is promising; so is Bampfylde. New Dolcoath is opening slowly, but better times are not far off. Others are advancing rapidly, and will soon be on the tapis as dividend-paying properties.

R. TREDINNICK,
32, *Fleet-street, London, June* 17. Consulting Mining Engineer.

NANT-Y-RICKET COPPER AND LEAD MINING COMPANY.

SIR,—I was pleased to see, in last week's Journal, a note from Mr. Park, the secretary of the company, informing the shareholders and others of the high price which the company's copper ore fetches. It appears to me, however, that Mr. Park is somewhat too reticent as to the present actual condition and future prospects of this valuable mine, though in these days that can scarcely be called a fault. Of the many valuable mines in the counties of Montgomery and Cardigan (and, the sage Mr. Ennor notwithstanding, we *have* many) I know of but few which hold out a better prospect of soon becoming large dividend-paying properties than this same Nant-y-Ricket Mine.

As during this week I have been in the neighbourhood of Llanidloes, I paid a visit to Nant-y-Ricket, and was very pleased to see that the dressing-floors were being much enlarged, and that large piles of copper ore (including about 10 tons ready for market) are accumulating outside. In No. 1 level I saw one of the richest composed lodes it has been my good fortune to witness. The lode in the forebreast is over 12 feet wide, the matrix of which is such as to ensure both permanency and increased value; it is well charged with copper ore, carbonate of lime, oxide, &c. This, it must be remembered, is but a few fathoms vertically and lineally from surface, but as the hill here rises very abruptly there will soon be ground enough laid open to necessitate a still greater enlargement of the dressing-floors, and the erection of all the multifarious paraphanalia requisite for the energetic and successful working of such a large property as Nant-y-Ricket. I fear the education of Mr. Ennor has been sadly neglected. Would he be surprised to hear of such mines as Dyliffe, Llanerchaur, Conroy, Nant-y-Iago, Rhoswydol, Cwm Byr, the Van, and Van Consols, all being in existence in this neighbourhood, not to talk of such unpretending concerns as Nant-y-Ricket? Come, oh! sage of Cornwall, and see for thyself. A. H.

MARKET MINES—'CIRCULAR MINING."

SIR,—Your correspondent, "Argus," in the Supplement to last week's Journal refers to the injury inflicted on legitimate mining by the modern system of company promoting, under which the bulk of the capital finds its way into the promoters' pockets, and then criticises Mr. W. Eddy, jun., for not sounding an alarm in the case of the Emma Mine, when it might have been of some service. That mining is brought into disrepute by the system alluded to I think few will question, and none who read the *Mining Journal* with any attention will come to any other conclusion than that the same practice prevails in respect to home mining, although on a smaller scale than with the American properties.

As a notable instance of the kind, some three years since an old mine in Wales was purchased, and reconstructed under the name of East Llangynog, and by circulars and other means worked up to the price of 200,000*l.* for the property, 10,000*l.* only being devoted to mining purposes. During the time this was taking place I ventured to hint, through the Journal, and to many friends privately, that it was not likely to benefit shareholders, and stated I would not give 5s. each for the shares on condition of holding them five years, which elicited an elegant rejoinder from a talented mining broker in Gracechurch-street, who was then urging the public to buy at from 3*l.* to 4*l.* per share; and what is the result? The working capital is nearly all expended, the shares are unsaleable at 10s. each, and I now predict before the five years are expired will be worthless.

Not to fall under the charge of being like Mr. Eddy, I now allude to another property being launched under similar conditions, and the same auspices. The Bampfylde Mine is being widely recommended by circular and other ways at 4*l.* 10s. per share and upwards, under statements that dividends may be expected at the rate of 40, or even 60, per cent. At 4*l.* 10s. per share the mine is 135,000*l.*, to pay 40 per cent. on which a yearly profit of 54,000*l.* must be realised, a sum the merest tyro in mining must know will not be reached. If it be covertly intended that 40 per cent. on the working capital (10,000*l.*) may be realised, that would yield but 3 per cent. on the price of the shares; and could that be guaranteed, 30s. per share is the extreme price I consider they would be fairly worth. I do not believe anything approaching that amount of profit will be made, and would not, on the strength of 20 years' experience of mining, give 10s. per share for them to hold for dividends. What is the real value of the shares it is difficult to state, further than that 2*l.* each could not recently be obtained on the markets, while one of the parties recommending them at 4*l.* 10s. would not name any buying price, and when

offered shares at 2*l.* each would not accept them. I, therefore, venture to predict that Bampfylde will not pay one fourth the profits it is represented as capable of yielding, and assert the shares are not worth more than one-fourth the price they are now recommended at by those who are writing up "this forecast of colossal fortune, and great intrinsic worth and magnitude." H. CROFTS.

Chatham, June 18.

DRAKE WALLS MINE.

SIR,—A loud flourish of trumpets heralds the re-working of this old mine, and the purchasers of the materials ask the public to subscribe the modest sum of 22,000*l.* for what has recently only cost them 5000*l.*, and money enough. It would be beneficial to legitimate mining if Messrs. Skewis, Gregory, and Co. would offer some explanation on this part of the business. Will they have the goodness to say if it is the "bal" tacked to the materials that makes it of this value? If so, why did the old company abandon it? Then, again, how can there be 72,000*l.* worth of tin in the refuse, when the average of the tinstuff risen from the mine never exceeded 12 lbs. of black tin to the ton? The bulk of this tin being taken out, what can be the worth of the residue? Even if the accumulated mass contains as much tin as asserted it would cost 100,000*l.* to recover it; therefore, the assertion is simply a myth. Some reliance may be placed on the remarks of Capt. Simmons, mineral agent to the Duchy. Doubtless for the sake of re-working the mine, he has said his utmost about it, which he sums up in the following words:—"He believed the prospects were quite sufficient for a good and profitable mine." Now, as it is only "belief" on the part of an authority whose interest was to make the best remarks he could, why should the public be called upon to assist in gratifying the avarice of the promoters by paying them 17,000*l.* for nothing? Surely such a sum ought to be better applied.—*Tavistock, June 18.* C. F. COLLOM, Mining Engineer.

TERRAS TIN MINE.

SIR,—About 20,000*l.* has been expended on this property, and about 7000*l.* worth of tin has been sold; add this to the value of the plant and machinery—say, at auction price, 5000*l.*—makes a total of assets of 12,000*l.*, showing a loss upon the working of 8000*l.*, nearly 7000*l.* of which has been spent upon the mine department. A 50-inch cylinder engine has been erected, and the engine-shaft sunk 40 fathoms from surface. Cross-cuts have been driven from the 30 and 40 fm. levels to Edwards's lode, and 1200 fms. of stoping ground has been laid open. Unfortunately, a little below the 20 the greenstone was met with, and the lode seriously deteriorated in value. Had the lode proved equal in richness in the 30 and 40 as it was in the 20, not one farthing of the capital would have been sunk, not one word of complaint uttered against the past; and notwithstanding all that has been said and written, there is only the paltry sum of 8000*l.* loss to the adventurers. The great mistake seems to have been made by the recent managers in condemning the elvan without first giving it a fair and impartial trial. The result of the past *five months* working confirms this view of the case. Nearly 2000*l.* has been expended, and not 1 cwt. of tin has been obtained from the lodes; nor does it appear that anything worthy the name of a lode has been discovered during that time. It appears that the course adopted by the present manager, Capt. John Nicholls, did not possess a remote chance of ultimate success, and having condemned the elvan he placed himself in a dilemma, and was hampered between two points—eating dirt or no tin; he chose the latter, hence the results. It is contended by all those who are conversant with the property that if the men had been employed upon the elvan instead of upon surface trials of the lodes that tin at least would have been obtained sufficient to pay all labour cost, and the greater portion of the merchants' bills. The state of things as they now stand is much to be deplored. We well remember the expression of Mr. Calder, the new managing director, that "there was no *fear for Terras under the present management.*" The result has shown that there is a good deal to fear. The Stannaries officer is now in possession, miners' and labourers' wages are in arrear to a serious extent, trade and other debts have accumulated, the new director has been recalled, and Capt. Nicholls has absented himself from the mine, and now disclaims connection with it. Better for the shareholders if he had never been appointed to the management, and now to desert them in their trouble is neither just nor honourable. The impression here is that if the former managers had remained the present difficulties would never have occurred, and in this we are borne out by universal public opinion. It is also considered by those competent to judge that the working on the elvan was the proper and safe course to pursue.

Grampound Road, June 18. MARTIN RICKARD.

THE PROGRESSIVE MINES OF CARDIGANSHIRE.

SIR,—A correspondent, Absalom Francis, whose name I frequently notice in the Journal, informs me that good workmen are plentiful, and at moderate wages—say, 16*s.* to 20*s.*; I must congratulate him on his good fortune. Others are obliged to suspend urgent operations owing to the scarcity of labour, and who would willingly give 25*s.* for good men. I notice this same signature to a letter on the subject of a mine called West Esgair-hir, immediately preceding my letter in the Journal of June 7. Why it should be called West Esgair-hir I am at a loss to know, as, according to the statement of your correspondent, it is two miles to the west and one mile to the south of the Esgair-hir lode, and consequently is quite out of the run of any discoveries which may have been made there. And as to the assertion "that the greatest and richest discoveries made in the county during a quarter of a century have recently been laid open," I can hardly see how the writer should know anything about it, as he has not seen them, nor has anyone connected with the mine given him such information, and consequently the statement is only made for an obvious purpose. I do not know anything of the position or prospects of the West Esgair-hir Mine, but when it is sought to encourage the shareholders by glowing accounts of a mine miles away, it does not look as if its own intrinsic merits were very encouraging. Notwithstanding this glowing account of Esgair-hir Mine, as being the greatest and richest discovery of a quarter of a century, allow me again to quote from your correspondent:—"Llwyn Teify Mine, in this property, one of the best discoveries—in fact, I may say the best discovery—in Cardiganshire for many years has been made." Comment would be superfluous. I hope and trust the time has gone by when the lavish use of adjectives will induce the public to invest their money in mining, and I trust you will use the great influence your paper possesses in the mining world to bring mining into a more healthy and lucrative condition. I have no personal knowledge whatever of your correspondent or his mine, I merely judge him from his published statements.

PLAIN MATTERS OF FACT.

EAST BOSCASWELL TIN MINE.

SIR,—I would call the attention of those interested in Cornish mining to the East Boscaswell Mine, North St. Just, which bids fair to become during the present year one of the best paying and richest mines of that district. Those who state that tin mines are not paying investments should look at what is being done at this mine. The proprietors, with only 32 heads of stamps, have returned during the past three weeks a large quantity of tin. The return was as follows:—3050 sacks of tinstuff stamped, of such good quality that this produced 4 tons 3 cwts. of tin. There is every reason to believe that the monthly returns will now be at the rate of 7 or 8 tons per month. This would give a profit of 300*l.* per month, as the cost does not exceed 300*l.*

The shares of the first issue were all taken up by a few persons. Investors would do well to secure some of the second issue. The above facts are of interest not only to the mine, they concern the whole district of St. Just. FRED. WARWICK.

Bucklersbury, London, June 19.

WHEAL BARNARD.

SIR,—I have more important fish to fry than enter into a controversy with either "Fair Play" or "Vigilans." They are both, no doubt, very clever and honest individuals, but after all it is just possible that, like myself, they would not scruple, if they had the opportunity, to buy an article cheap and sell it dear—this life's grand secret of making money. "Vigilans" remarks that the sale of 2000 ounces of silver to Messrs. Venables and Co. looks very well upon paper. Of course it does. Who disputes it? But, surely, it looks still better in the hard cash received for it. How refreshing to your correspondents must be their earnest attempts to "suppress the irrepressible." It is amusing to note the rancour displayed, simply because one solitary individual in a remote part of England can float a mine by his own unaided efforts, without so much as a director to grace his prospectus, when the present hard times and stress of weather cause schemes propelled by half the great men of the great city to abandon, or at least postpone, their voyage. As regards the premium to which "Vigilans" refers, now asked by the promoters, that is their affair. I am simply an agent, but would like to know if "Vigilans" ever obtained a good mining sett, opened it up, made it a success by the returns of silver, tin, copper, and arsenic, and then offered shares upon the same terms as he himself paid for the article when in embryo? I pause for a reply, and simply remark that this has been done by the promoters of Wheal Barnard.

With reference to "Fair Play," and his questions relative to profits, I can only answer that the silver extracted from the burrows is most certainly not paying the entire cost of an expensive steam engine, and the opening up of an extensive mine; but charging the direct cost of coals, salt, and labour, and all incidentals to the treatment of the low class 5-ounce stuff, even on the present small scale and high prices of coals and salt, good profits are being derived. He must indeed be a poor unlucky individual who has not one talent to boast of; my one talent, and, perhaps, the only one, seems to be the happy knack of raising money to work mines. Alas! is it not ten thousand pities that the seed sown has not ere this brought forth fruit? Perhaps "Vigilans" will kindly introduce me to a real good mining property, and I will set to work to find money for developing it, as I should derive far greater pleasure and benefit in introducing good mines than poor mines to capitalists. "Fair Play wishes me to have either assistance, or my quietus. What can be more simple? The present greatest mining authority is Capt. Teague. I have not the pleasure of knowing that gentleman, but if you, Mr. Editor, will make arrangements with him for inspecting Wheal Barnard I will have placed in your hands a sum not exceeding six guineas for his professional services; and, perhaps, you will kindly insert the report in the Journal, whatever it may be. If a rich bunch of silver, with plenty of low-class silver stuff, and copper, tin, and arsenic in abundance as auxiliaries, do not constitute at least a fair promising mine, then let me have my quietus at once, and I will, without further delay, withdraw my one talent, and take it to a more profitable market.

It is far from my province to interfere needlessly with other parties, but your impartial Journal is open to one and all, and what I am about to mention is for the good of mining generally. The late sale of the Devon Great Consols has been the wide-world talk: hundreds of tons of copper ore sold for 9*s.* per ton. Now, we all know that the smelters' return charges are 2*l.* 15*s.*, and therefore 9*s.* per ton represented 3 per cent. copper. It is an ill wind that blows nobody any good, but in this particular breeze very little coin could have been wafted into the pockets of anyone, save those employed in the transit of the ore to the smelting furnaces. Now, I maintain that at a few shillings cost this 3 per cent. ore could have been concentrated to 60 per cent.; and why drag 20 tons scores of miles, and pay the smelters twenty times 2*l.* 15*s.*, when there is only the necessity of the transit of 1 ton, and the smelters charge of 2*l.* 15*s.*: 1 ton of 3 per cent. ore will yield about 1 cwt. precipitate, by converting the copper into a chloride and simply washing out and precipitating it with iron or zinc; but that is not all, more than likely the ore sold for 9*s.* gave 8 ozs. of silver to the ton, but say only 5 ozs.—thus, in 1 ton precipitate we have 100 ozs. silver, as it is a moral impossibility for the copper to be thrown down without the silver; 1 ton of water is sufficient for lixiviating 1 ton of stuff, and in less than 24 hours by the assistance of a jet of steam injected in the wooden vat holding the solution the concentration of 20 to 1 effected. I allow that all cannot be extracted, but 90 per cent.—in fact, we treated 1 ton of silver ore yielding 20 ozs., and the residue, after lixiviating, gave but 1 oz. Some may argue that it is folly to send even 60 per cent. copper to the ticketings containing 100 ozs. silver. Then why send it? There are ways and means of collecting the silver pure by the wet method, and the 60 per cent. copper ore can be sold as a copper ore. I would ask, what has become of the hundreds of thousands of ounces of silver sent away from the Devon Consols? Perhaps the smelters know, and if they really do not, all the worse for them and the nation. There is no excuse about the cost of coals, for 5 cwts. will treat 1 ton stuff, and is it not better to convey 5 cwts. coals from Wales to Calstock than 1 ton of 9*s.* ore from Calstock to Wales? I intended writing more fully, but am called away with the good news that a rich branch of silver is making its appearance in the eastern silver shaft.

Abbey Mount, Tavistock, June 18. THOS. J. BARNARD.

FORTESCUE TIN MINE.

SIR,—This mine appears to be all that can be desired. Great activity is being displayed, and the agents are already in a position to return large quantities of tinstone to market, but prefer waiting until stamps and dressing machinery are erected, so that the company may be able to reap the whole profits. A 34 inch cylinder double engine (rotatory) is working. It is a splendid engine, said by the engineers to be equal to the best in the county. The management I believe to be economical and safe, and the mine is being developed in a miner-like manner.

June 19. STANNUM.

PERKINS BEACH MINE.

SIR,—The market value of this enterprise is just now called 7500*l.* Compared with its adjoining neighbours, Bog and Pennerley, and we find the former (with its 15,000 shares, at 2*l.*) to be worth 30,000*l.*, and with the latter (with its 12,000, at 2*l.* 5*s.* per share) to be valued at 27,000*l.* A question here arises—Is Perkins Beach only worth one quarter (say) of the value of these two mines, situated in precisely the same group of rich properties, with at least equal chances of turning out wealthy? The report of May 29 speaks for itself, the absence of a large feed of water in the White Stone lodes being a true feature that the Great Spar lode is not yet cut, but that it is close at hand. These shares at the present price are well worthy of notice; six weeks since they were called 10*s.* to 12*s.* 6*d.*, without immediate prospects of success. The Tankerville great lode runs through this property, and the Snailbeach lodes also run parallel to Perkins Beach. Just 20,000*l.* has been paid in dividends in Snailbeach adjoining, surely a great matter for the mine I now bring before the notice of your readers. The mine is on the limited liability principle, 1*l.* per share fully paid, and has no further liabilities. It contains plenty of barytes, for which a good market is now obtainable. This mine is considered by the best authorities to be an equally valuable property as its neighbour Tankerville, but with more lodes passing through it than in the latter. When it is considered what splendid results have been obtained in the adjoining mines within a comparatively short time, few speculations equal the present opportunity of making a pretty certain gain of a substantial nature as in an investment in Perkins Beach.

June 18. OBSERVANT CORRESPONDENT.

PERKINS BEACH MINE.

SIR,—With reference to the enquiries for information respecting this mine, by "Vigilans," in the correspondence of last week's Journal, I beg to say that this mine is now being inspected by first class authority, and that a meeting is to be held shortly, at which it is believed very gratifying intelligence will be communicated to the shareholders. The mine is now attracting the attention of speculators in Shropshire and elsewhere, not only from the immediate prospect of cutting the "great spar lode," but also because so many known rich lead lodes traverse the sett. In a short time it is believed that Perkins Beach will open out a prospect of great wealth. The mine has not received the attention from the public due to its merits, undoubtedly, and has been knocked down to a mere nominal quotation.

Bromley, June 16. CLARENCES.

LLUESTGOTTA LEAD MINE.

SIR,—Knowing your willingness to lay before the mining world all matters appertaining to mining properties if honestly represented, I beg to hand you the following remarks on the above mine. Its location is in the upper section of the Cardiganshire mining field, and its lodes traverse the same mineral-bearing clay-slate formation as the best mines in the district, such as East Darren, South Darren, Goginan, Bronfloyd, &c., while Esgair-hir is only three quarters of a mile north, and Hafon and Ffenllwch, with Eaglebrook, are on the opposite side of the valley. The main lode yet discovered is undoubtedly the champion lode of the district; it can be followed for ten miles or more inland by its outcrop to surface, and, where properly developed, successfully mined. At the most westerly point that it has been opened the best deposit of lead is being worked that has ever been discovered in the county so near the surface; besides this, there are other lodes traversing the grant for more than a mile. An adit level has been driven on this main lode for a few fathoms only, and, so far, it maintains its size and promising character, being 10 ft. wide, composed of blende, lead, quartz, carbonate of lime, &c.; in fact, the component parts of the lode are of so high a kind that, I believe, it cannot fail to be very productive of large bodies of lead ore. By driving the above adit level 50 fathoms 30 fathoms of backs will be gained, and increased as the level is extended. The other facilities for cheap and expeditious development are equally favourable, and I have not the least hesitation in saying that in developing this property capital will be made very remunerative. R. R.

Goginan, Aberystwith, June 19.

MR. R. SYMONS, AND "JAPHET."

SIR,—I did not expect that my letter, which you were good enough to publish in the Supplement to the Journal of May 31, would have induced Mr. R. Symons to admit that the reputation of a man and a gentleman was the object of his attack. I will, Sir, with your permission, reproduce his own words, lest I might be adjudged to have put a wrong construction upon them:—"It is very generous on the part of 'Spectator' to come to the rescue of 'Japhet's' reputation," &c. I was not aware when I wrote the letter refetred to that the reputation of that gentleman was the real object of Mr. Symons's attack, but thought it was provoked by his being pressed or pestered on account of the part he had taken in support of the Terras speculation, and that under the force of pressure he turned to the object against whom his feelings were strongest, and that then without due consideration he injudiciously set about shifting the blame attaching to himself on to the shoulders of another, and my writing to express my views of the case was prompted by a sense of justice, and not by generosity; therefore, I disclaim credit for a virtue wrongly attributed to me in this case, and, further, I do not think that the reputation of the gentleman in question has been imperilled or tarnished a whit by the attack which has been made upon it, but that it is one of a class which can live down such petty spite.

Mr. R. Symons had previously expressed what he calls an opinion of the Terras affair, and my writing was principally for the purpose of ascertaining from him the facts upon which that opinion was founded. I take it, Sir, that when an individual considers himself of sufficient importance to express opinions on important public matters through the medium of the *Mining Journal* that he ought to hold himself prepared when his views are questioned to state the reasons or facts from which they originated, and on which they rested.

The Terras Mine was started with a paid up capital of 25,000*l.* It is presumable, therefore, that that sum was considered amply sufficient for the requirements of the mine. Now it turns out that it was not sufficient, and Mr. R. Symons, who states that he is actuated by a sense of justice in the public interest, says, in effect, that the reason why it proved insufficient was because the market price of the shares went above par, or because certain parties purchased shares at one price, and sold them at another. Now, I contended, and still do, that the market price of the shares of an incorporated company fully paid-up could in no way whatever have affected the intrinsic value of the mine, nor its practical development. I freely grant that the grievous disappointment which Terras turned out to be to the shareholders would operate injuriously against their subscribing additional capital to prosecute a scheme reduced or degraded from a lucrative investment to a questionable speculation. It seems to me an unjustifiable leap to jump over the heads of the Terras executive to attack an outsider, whose greatest fault seems to have been his subscribing to the official representations or misrepresentations of the mine. It is quite possible that the gentleman assailed by Mr. Symons was as much deceived in Terras as anyone else, but by possessing a penetrating judgment to explore beyond the region of tangible realities he might have managed to extricate himself in time to escape a serious personal disaster.

I cannot see how a broker is to be blamed for repeating the official statements of men considered sufficiently respectable to be the executive of what is supposed to be an important mine, and in whose character veracity is understood to form a distinguishing trait. It will require something more than a mere denial on the part of Mr. Symons to convince me that he acted unbiassed by malevolent feelings in his attack upon "Japhet's" reputation, especially when such denial is supplemented by words like the following:—"But the author of an advertisement is never more *contemptible*," &c. May I ask the gentleman whose unfortunate expression this is, and who pretends to be very chaste in the selection and use of words, from what state or feeling of the mind does contempt arise? Can one despise a person without hate, and can hate be entertained independently of malevolence? To say that one is and that the other is not would be a contradiction in terms. I see no alternative but that to justify himself he must either retract what he has said, claim for language a latitude and construction it will not bear, or else produce some better reasons than he has yet done for the course he has taken. If he was actuated by personal ill-feeling—and, indeed, it is impossible to see by what else he could have been, to take no higher testimony than his own admissions—his designs must have been sinister in the extreme, but happily will prove an abortion—at least so far as the object against which it was directed is concerned; but so far as the generality of your readers are concerned it ought to operate as a warning to others against accepting the unsupported statements of interested writers, with whatever blandishments they may be presented. To re-assert an opinion that if Terras shares had not been sold above their par value the operations of the mine might have been continued with more regularity and success only leaves me where I was in my former letter, and just where my comprehension staggers "and reason reels." But I wish to be enlightened by Mr. Symons as to the *modus operandi* by which that result might have been brought about. He also adds—"I am of opinion that the collapse was hastened by the high price paid for the shares, exhausting probably both the means and good temper of the investors." This mainly serves to imply, so far as I am able to judge of its meaning, that if the shareholders had been kept in good temper they might have been induced *(cajoled)* to subscribe additional capital for the further prosecution of the mine. If the Terras was a good mine, and 25,000*l.* was sufficient to develope and make available its resources, I am utterly at a loss to conceive how that by any possibility an increase in the market price of the shares could have led to a corresponding diminution of results from the practical working of the mine. The same price per fathom would be paid for breaking the ground whether the market value of the shares were at 1*l.* or 100*l.*, as well as everything else relating to the working cost of the mine would be unaffected by the current price of the shares. I do not ask if any part of the working capital was misappropriated, for that I know was the case, as dividends were paid therefrom to the extent of 3*s.* per share, amounting to 3750*l.* in the aggregate; but I would like to be informed whether, in the opinion of Mr. Symons, if that amount was resubscribed it would be sufficient to enable the company to make legitimate dividends from the resources of the mine; and also whether the dividends declared by the Terras Company were in reality declared by itself or some other person or persons wholly unconnected with the administration of its affairs. SPECTATOR.

TERRAS MINE.

SIR,—Who is Japhet, Japhat, or Japheth, who has been figuring in your Journal? Is he ashamed to give his name? If he is an honest man, as he would have your readers believe, let him come forward and boldly say "I am the man." I do not think it fair that in a discussion, in which personalities abound, that one only of the parties should have a "masked battery." Mr. Symons does not appear afraid of the revelation of any thing that he has done; and, therefore, he has given his name. If Japheth's hands are equally clean, he should give his name likewise. I think that Japheth has done wrong by writing some untruths in his letters with a view to depreciate his antagonist in public estimation. He had better tell us who he is. Brokers may know him by his name Japhet, but your general readers may not know him, any more than your obedient servant.

Ilkston, June 11. J. W.

[This discussion must now terminate. It has become too personal, and also lost its interest for the general readers of the Journal.]

THE EMMA SILVER MINE.

SIR,—I beg to inform "Argus" that on my return to London from the Emma Mine I got an advertisement inserted in the Journal offering information respecting that mine, and to the parties who applied to me I gave the facts as stated in my letter in last week's Journal, accompanied with a diagram showing the underground workings, taken from my own measurements. Since my arrival in London I have found other work more beneficial than writing unsolicited reports.

Pendeen, Cornwall, June 18. W. EDDY, Jun.

[For remainder of Original Correspondence see to-day's Journal.]

MINERS' ASSOCIATION OF CORNWALL AND DEVON.

The annual report of the Miners' Association of Cornwall and Devon, extending from the general meeting in May, 1872, to that in April of the present year, has just been issued, and contains a large amount of very interesting reading. It is to be regretted that the financial position of the Association is no better than it is, since funds are essentially necessary for securing the success which appears to attend the society in all other respects. Owing to his impaired health Mr. Robert Hunt, F.R.S., has been compelled to resign his position as honorary secretary, but he expresses the hope that he may be able, upon his recovery, again to lend a helping hand to the good cause of promoting a knowledge of science amongst the working miners. Mr. J. H. Collins, F.G.S., has been appointed honorary secretary in the place of Mr. Hunt, and Mr. Benedict Kitto, a former student of one of the classes, has been appointed lecturer. At the general meeting last year Mr. Charles Fox, referring to the advantage to the miner of technical knowledge, observed that the dressing of tin ore now became of enormous importance in the county. Anyone could see that when 1 lb. of tin ore was worth only 3*d.* they might afford to lose it, or it might not pay to return it, but when a single pound of tin was worth 10*d.* the loss came to a great deal, *for* if they took it, as he thought they might, that 600,000 tons of stuff were stamped in the county every year if 1 lb. in every ton were lost the loss was 25,000*l.* to 30,000*l.* a year; when they had the stuff at the surface they should return it by all means.

A popularised reprint of the "Observations on the Metalliferous Deposits of Cornwall," by Mr. W. Jory Henwood, F.R.S., F.G.S., has been extracted by permission from the "Journal of the Royal Institution of Cornwall," which will prove of great value not only to the members of the classes, but to miners generally, forms the first paper in the volume. The paper by Mr. Collins on "The Sciences of use to Miners" follows, and is a valuable contribution. The report of the August meeting contains a short discussion on stamps, which has been already given in the Journal. Mr. J. B. Jordan contributes "A Few Remarks on Rock-Boring Machinery, and the Results to be obtained by a Judicious Use of it." He explains that he was sent to Prussia to ascertain the practical value of Sach's boring machine, for which purpose he visited the mine of the Mechernicher Actien Gesellschaft, a lead mine in hard sandstone. Of all the boring machines we have seen we should have supposed this to be one of the least likely to come into general use, yet from his enquiries he considers it a practical success, and a good and useful tool; if this be so, many of the other boring machines before the public should receive immediate attention. The work is done in about one-fifth the time required by hand labour, and Mr. Jordan estimates that with machinery and dynamite ground could be driven for 2*l.* per fathom, which by the system of hand labour and powder in use in Cornwall now costs 7*l.* per fathom. There are also papers on a Thermal Spring at Wheal Seton, by Mr. H. Tilley; on Cross-branches and Cross-heads, and their effect on Mineral Lodes, by Capt. Wm. Tregay; on the Excursion of the Hayle Class to St. Just; as well as several short notes of a useful and interesting character. The report should have an extensive circulation.

The Prize Essay—Practical Mining.

NO. IX.

SECOND ESSAY—PART III.

HOISTING.

The best "mining machinery" depends on the varied circumstances under which the engineer is placed, perhaps skips and kibbles might be both employed in one mine to advantage; if the shaft is vertical skips and flat-ropes may be used, as in the best Cornish practice, but a better method is in laying out all the levels with tramroads, and running the wagons into cages provided with safety catches, for for hoisting, thus avoiding filling at both ends, and saving the labour, wear and tear of tools and machinery, and obtaining speed. With regard to the kind of engine used for winding, among the many now employed, those so much in use in the collieries of Wales supersede those of the Western Counties, being more under control and easier managed. They consist of pairs of horizontal engines, the cranks of each connected to the same winding-drum, and fixed at quarter stroke; one starting handle actuates both the slide valves, and from same position a steam brake can be set into operation by the foot; the brake is a strong wood-faced iron strap, and possess perfect control over the engine; the large 15-ft. winding-drums are made to turn either way, and the wire-rope wound on the drum, so that when one unwinds the other winds; other machines are often attached to same engines, and constructed to turn in and out of gear as circumstances may require. They are economical in the consumption of fuel. All winding-engines should be supplied with a powerful brake, in some cases a steam brake is advisable, also signal indicators, winding indicators, speed recorders, and all modern appliances introduced for the prevention of accidents in winding; those additions are exceedingly cheap, and show the number of revolutions, speed attained, and number of wagons raised, which data is recorded for reference in after years, showing the progress of the mines daily.

MAN-ENGINE.

The man-engine appears to be the best means that has been adapted for raising and lowering the men to their work in metalliferous mines, and as it requires no attention, and can be detached from the engine after the shift is at work, unlike the safety cage, the men are enabled to go to their respective levels with ease, speed, and without fatigue. The single-rod ordinary man-engine, as seen in Cornwall, worked by the winding-engine, with platforms attached every 12 ft., and the rod making (say) 60 ft. per minute; with this machine 100 men could be lowered 1000 ft. in little in excess of half-an-hour, and it must be remembered that the same number of men can ascend at the same time; now, the safety cage would require to be run many journeys and at great speed to accomplish the same thing, unless the cage were capable of carrying a great number, and moreover the men have to climb to their respective levels after being landed. If the shaft is a guided shaft, and the cages are used, the men will ascend and descend by this means. The economy carried out at many mines in still retaining the old-fashioned ladder way calls for a passing notice: it is quite as rational to continue the old practice, which is scarcely yet extinct in some foreign mines, of bringing all the ore to the surface by bodily labour, as to still persist in the old method of descending and ascending into deep mines. The enormous wear and tear and loss of muscular power among the men must be considered; the organs of respiration are so deranged that the lives of the miners working underground, using some 200 fms. of ladder-way, are shortened by many years, and numbers of men are rendered unfit to follow their avocations underground very early in life; the ascent and descent every day of even 50 fms. in a perpendicular ladder-way affect the heart and lungs seriously and most powerfully, and immediate death ensues if the miner slips, loses his hold, or is careless of broken staves, &c. Such disease engendered among miners ought to cause those modern aids and improvements to be used in mines even of comparatively shallow depths. The shareholders would be the gainers in every case, as the men landed fresh at the level where their labour was required would execute more work, and the speedy development of the mine is the course that must be followed if we would be prosperous.

Various schemes and devices have been resorted to, and many improvements said to be effected, and in some cases may be admirable. The cumbrous balance-bob might be done away with, and a column of water used in its place, similar to the Echelles Mobile, or

Varocqueers, in France. Rack and pinions have also been used in France to equalize the motion, that one platform may rest exactly opposite the other, and no doubt this will answer the purpose; but it is a complication, and the racks and spur-gear need be very strong and well manufactured to prevent constant breakages. Another plan have been adopted—to extend the piston-rods through the covers of the cylinders, so that the two rods may be connected by chains and pulleys over head; this, no doubt, is simultaneous action, but is not so simple and efficient as the single-rod engine as used in Cornwall. The rolling and unrolling an endless chain over pulleys, as the alternate winding and unwinding of two cables have also been tried; but the universal machine employed, and the best man-engine, is as described at the commencement—the single-rod, as used in the West of England.

Name of Mine.	Character of man engine.	Depth in fathoms.	Diameter of cylinder of engine in inches.	Length of stroke in feet.	Revolutions per minute.	Strokes of rod per minute.	Sizes of rods.	Speed of raising men.	Time raising the men from the whole depth.	Horse-power. Remarks.
Treavean	Double rod	290	32 in.	6 ft. in engine. 12 ft. in shaft.	15	3	8 in. square all the way.	72 ft. per min.	24 minutes.	This engine also works a pair of crushing rolls.
United Mines	Ditto	210	30 in.	6 ft. in engine. 12 ft. in shaft.	18	3	60 fms. 7½ in. sq. 100 fms. 7 in. sq. 50 fms. 6½ in. sq.	72 ft. per min.	17½ mins.	
Fowey Consols ...	Single rod	280	30 (ft. × 6 ft. Overshot water-wheel	6 ft. in engine.	5	5	8 in. square.	60	28 mins.	
Dolcoath		220	20 in.	12 ft. in shaft.		3½		42	21 mins.	
Providence Mines.	Single rod	150	20 in. rotary	12 ft. in shaft.	20	5	8 in. square.	60 ft.	15 mins.	
Wheal Vor	Ditto	170	30 in.	6 ft. in engine. 12 ft. in shaft.	5 strokes.	5	8 in. square.	10 fms.	17 mins.	About 30 horse power direct-acting.

Botallack ..... Skip on an inclined plane of 32°, carrying eight men, and makes an ascent and descent of 500 fms. in 20 minutes.
The horse-power required depends on the number (and size) of men ascending or descending, but about 1 horse-power for 5½ fms., or 12 per 70 lbs. (about) is a near approximation.

LIGHTING MINES BY GAS

Is a subject that should receive some consideration from those seeking to lay out a mine in the best and most economical manner, and every appurtenance that secures this end must be classed among the best mining machinery, with its adaptations and appliances. The present method of burning tallow candles in our metalliferous mines is little in advance of the methods employed among the Romans, with their open box of fat and coarse wick; or that of Sweden, where they use splints of resinous pine; or Brazil, where they have oil obtained from nuts of the Palma Christi; the smoke and fumes from such substances are almost suffocating, and, as in the use of candles, very detrimental to the health of the miners, especially where cheap stuff is used; in this case the smoke and stench is much greater. There can be no objection to lighting by gas to a partial extent, if not solely, and lighting up the dressing-floors and surface works, carrying on the dressing operations by night as well as day, and this is required more especially during the winter months when the day is so short. A fair average specific gravity of gas, referred to air, is 0·5, and to force this from the surface to 150 fms., and maintain a steady pressure on the burners, allowing for the resistance in the pipes, will require a pressure of about 10 in. (less than this have been found to answer very well), and for deeper mines it is only necessary to increase the pressure column or head of water. Various methods have been adopted for forcing the gas down a shaft—fan blowers. A wooden "trompe" is an efficient, regular, and cheap apparatus; a turbine, or small wheel is sometimes used, and is, perhaps, more economical, as the "trompe" uses a considerable amount of water; pumps have also been tried, but the use of a gasholder at the bottom of the mine to meet the difference between the supply and demand is highly objectionable. A jet of steam will carry the gas down, but the lights are unsteady, and the sudden condensation of steam in the pipes will cause the gas to go out, but may be immediately re-lighted; a bucket of water thrown on the outside of the main will cause sufficient condensation to put the lights out. Now, a water column having the necessary pressure, is found to answer all practical purposes, sending a small stream of water down a 4-in. pipe; the stream is conveyed from the head to about 12 ft. in the 4-in. main through a ¾-in. pipe, terminating with a 3-16th in. jet, which carries the gas down the pipe, maintaining a pressure at all the galleries and levels, the water running off through a syphon, or trap, below the lower series of jets. If the demand for gas is stopped, no injury to the apparatus is sustained. The water is obtained from a cistern supplied by the engine, or other means as may be devised sufficiently high to give the proper pressure; it will be argued that the water must be pumped up again, but the quantity is so small it will be more than compensated by the increased light, which means more work, with more comfort to the men, and less cost. The water used is so small that it is not felt by the engine, and the engineman's reply to this question is mostly, "If I were not cognisant the apparatus was there I should not know by the engine." If the mine has a deep adit the trap need not be carried beyond; the water will empty there, and there will be ample pressure to force it to all the deeper levels. An experiment was tried at Balleswidden in 1866-7, where gas was carried to 120 fms., and lit up all the levels; it was also carried through flexible tubes up in the backs or pitches, and to individual labourers and explorers; and where a pare of four men were at work, one jet gave sufficient light for the whole far superior to candles, with less noxious smell, and it was officially reported that the mine was lighted at a third of the cost to that of candles. The reason of discontinuance of this mode of lighting I am unable to learn, but the practice is very common in the North of England, where it is carried out with economy, requiring no care or attention other than keeping floating matter away from the pipe, which may become choked.

ROCK BORING.

In our Cornish mines the old system of hand-boring is still almost exclusively used, in spite of the many attempts made to introduce rock-boring machinery; but machine work is gradually and surely gaining the ascendancy over manual labour. Many rock-drills have been invented, ingenious of their kind, and performing a considerable amount of work in a short space of time, among which may be mentioned as holding a prominent position the "Burleigh Rock Drill." This is a most admirable machine for the general purposes of rock-boring in our mines or quarries; the drill point is attached to the end of the steel piston-rod, is rotated as the blow is given by ingenious mechanism, and the forward motion of the cylinder is regulated by proper feeding gear, the amount of which depends on the nature of the rock being cut away; the maahine is easily fixed at any angle, requires but one man to work it, and will bore 1½-in. holes in rock of the average hardness of the county at the rate of about 14 in. per minute. Of course it would be impracticable to convey and use steam for the purpose of working this machine in the shafts and levels of our Cornish mines; but it will work equally as well with compressed air, which may be conveyed any distance with but very little loss of pressure; the air is compressed at the surface with a small engine specially provided for that purpose, each machine requiring about 3-horse power. The compressed air acts precisely in the same manner as steam, but has this great advantage—the air, in being released from the cylinder, escape into the shafts, affording the workmen a full supply of pure air, not often attainable in mines. The Burleigh Rock Drill is, I believe, now working in Cornwall, and giving the utmost satisfaction.

BLASTING.

For the purpose of splitting and detaching rock no method has yet been found to be superior or equal to blasting with some violent explosive, such as dynamite or gunpowder. Of these two I prefer the former; dynamite is far more explosive, and consequently more powerful, than gunpowder, and I think the risk of accident is considerably lessened by its use. It may be lit and burnt harmlessly in the hand, but if simply placed on a block of granite covered with earth, and ignited by percussion, the rock is shattered to pieces. Many machines have from time to time been invented for the purposes of tunnelling, quarrying, driving levels, &c., but at present nothing has been found to supersede the ordinary method of blasting with dynamite or gunpowder, the holes being bored by a rock-boring machine.

[*To be continued in next week's Mining Journal.*]

COAL MINING IN SCOTLAND.

At the Select Committee on Coal, Mr. Andrew Landall, managing partner in the Lochgelly Iron and Coal Works, Fifeshire, said he had had 30 years' experience, and employs at present 750 men. In his collieries the cost of producing 1 ton of coal was in 1868, 4s. 9½d.; in 1869, 4s. 2¾d.; in 1870, 3s. 10d.; in 1871, 4s.; in 1872, 7s. 4d.; in 1873, 8s. 6d. The yearly output per man employed was in the same year 504, 580, 554, 514, and 445 respectively—that is to say, from 1869 there was a gradual diminution in relative production. In the same years wages went up, the day's wages of the hewers who worked at the highest rates being 4s. 6d., 4s. 10d., 5s. 11d., 6s. 4d., 7s. 7d.; the average wages of workmen all over the pit, including labourers and hewers, being 3s. 9d., 3s. 10d., 4s. 1d., 4s. 10d., 5s. 8d., and in 1873, 8s.; and the day's wages of the hewers, who worked at the lowest rates, being 3s. 4d., 3s. 1d., 3s. 4d., 4s. 3d., and 5s. 3d. The pits worked 241 days, 264 days, 244 days, 251 days, 212 days in the respective years; and the average selling price per statute ton was in 1868, 5s. 10½d.; in 1869, 4s. 6¾d.; in 1870, 4s. 0½d.; in 1871, 4s. 2d.; in 1872, 9s. 10d. The price is now 13s. The average number of days worked per week is four or four and a half. The pits go for four and a half days, but they are not full, many men are idle during part of that time. For some years one idle day has been observed in every fortnight—that is the Monday after pay Saturday.

As to the circumstances under which wages have increased, and in answer to the question whether wages advanced before prices, or *vice versa*, the witness said that generally wages had advanced before the advance in the price of coal. (Mr. McDonald said that in no case had this occurred, but he was contradicted the same day by a coalowner of West Yorkshire.) Before Jan. 1, 1872, the wages paid to hewers were 2s. 1d. per ton; the price of coal to consumers 7s. 6d. On March 20 wages were raised 2d. per ton; on March 25 prices were raised 6d. per ton. On June 26 wages were raised 4d. per ton, 5d. on August 21, 4d. on September 18. On Dec. 11 they were reduced by 5d., but advanced by the same amount on March 1, 1873. After the rise in the price of coal from 7s. 6d. to 8s. on March 25, 1872, the following advances were made:—June 21, 1s.; August 1, 2s. 6d.; August 14, 2s. 6d.; August 26, 2s.; September 6, 2s. The price had now reached 18s. (this was for common steam coal), but it was reduced by 2s. on Nov. 1, and by 1s. 6d. more on Dec. 2. On Dec. 19 it rose again by 2s.; on Jan 7 a further advance of 1s. 6d. was made. April 1 was the date of a reduction of 1s., and on May 1 a reduction of 2s. was made, leaving coal at its present price, 13s. There is no local custom according to which a certain rise in price justifies an application for an advance in wages, but ordinarily if coal advances in price by 1s. the men demand 4d.

There are associations of masters, who never take into consideration any question of price; the subject is not even spoken about. But the matters discussed are the regulation of wages, and the rates paid to railway companies for carriage of coal. The coal allowance to the men is 16 cwts. per month; that is sufficient. The coal is charged to them at various rates below the market price. The charge used to be 2s. 6d. per ton, or 3s. 9d. delivered at their houses. Till the last three months the two prices were 4s. 9d. and 6s. 3d.; now 7s. 6d. and 9s. 10d. There were many remonstrances from the men against the increased charges, and a great deal was said on the subject of house rents; but he believed, as an employer, it would be far better to charge the men the full market price; and that they were trying to reach by gradually raising the price. In his collieries no advances on account are made. Pay is once a fortnight, and there are no demands for more frequent payment. He wished to reply to Mr. McDonald, who had said that between 1860 and 1864 colliers would not earn more than 10s. a week. Witness himself found that they earned in those years 21s. in the average, free of deductions. The men have shortened the hours of labour because they can earn as much as they want in a short time, and they know that short hours restrict the output and so keep up prices and wages. He does not believe the statements made to the committee as to the exhaustive nature of the labour. He knows of a number of men who find it possible to work every day when the pit is going. The men are healthy, and not nearly so hard worked as the men employed in ironworks, and especially at the furnaces. He knows no case of "black lung," except in two old men, who, no doubt, contracted the disease in the old days when collieries were less efficiently ventilated than at present. He does not think there will be any such cases now. The agitation for shortening the hours of labour did not proceed from the miners themselves but from delegates. In the matter of the Special Rules, the men had always in Scotland done the propping to preserve the roof of the mines. They were willing to continue this practice, but Mr. McDonald had recommended the Nortnumberland and Durham system, where propping is done by the masters. This was with a view to legislative changes, and the obtaining of compensation from the masters for all accidents which might occur. Where the character of the mines made it suitable the North of England system was already adopted in Scotland, but in some collieries the necessities of propping changed every ten minutes, the roof requiring support as the coal was taken out. The roof is usually good in Scotch mines. The Union rules forbid men to work more than eight hours in the twenty-four. If a man violated the rules he would be put out of the Union, and then he could not work as a miner anywhere in the district, for the men would leave a pit where the master took him on. No non-Union man is employed in the district.

Witness attributes the rise in prices to the restriction in output, combined with the demands of buyers, who offered a higher price for prompt delivery. A ship would come in, and find its turn to be three weeks distant. In order to be loaded straight off, the agent would offer 3s. a ton above the current price, and in this way the price rapidly advanced. There was a great deal of panic in it, from shippers being afraid that they would not get coal. The iron trade, which in Scotland consumes more coal than any other, had not in Scotland recently consumed more coal than in former years. In fact, there was a falling off of 17,000 tons in 1872, and of 46,000 tons in 1871, in the production of pig-iron; but a large amount was thrown on the market, accumulations which in 1870 amounted to 665,000 tons having now been reduced to 70,000 tons.

Coal is stacked less than formerly because of the objections of the men. It deteriorates in quality if kept exposed, but the custom is to cover the round coal with slack. Coal so preserved for 15 or 16 years he has lately used in the blast-furnace. It brings as high a price as other coal. They stock usually at the slack season, to be ready for the shipping when it comes; and to keep the men, whom it is much easier to lose than to regain. They required more men, more pits, more houses. They built 100 new houses in 18 months; and though the high rate of wages enabled them to draw men from other employments, the limited accommodation limited the number so attracted. The men object to immigrant labour, and insist on entry money being paid. The amount so required has now risen from 10s. to 5*l.* for every fresh hand. This money is paid to the Union. Fresh labour is supplied by wrights, smiths, and other tradesmen, sailors, agriculturalists, and anyone who can be got. A great many new pits have been opened in the district.

There has been a great increase in royalties in the case where the rent reserved was a fixed proportion of the sales prices. This is the old system, and the usual proportion is one-eighth. Lessors are now returning to it. In other cases a fixed sum per ton was payable, and where this had been 7d. or 8d., it is now, in fresh leases, 10d. or 1s. It has not happened, he said to Mr. Stanhope, that in these cases the landlords have actually received a smaller sum of money in the year during the period of high prices than they received previously, because the accumulations have been sold and royalty paid on them. In Scotland the royalty is payable only when the coal is removed from the land demised, a practice different (says Mr. Stanhope) from that which obtains in Yorkshire.

Mr. Edmund Potter, Mr. Wharton, and Mr. Pease discussed the question of the miners' cottages with the witness. He builds two-roomed cabins, and he charges for rent 2s. 6d. per fortnight. He has built four-roomed houses, and would like to build a number of them, as Mr. Pease has done; in fact, he has pressed the more respectable colliers to move into the better house, and found that the majority of the colliers prefers the low rents and bad houses. They know no better; they have been so brought up. Both rooms are bedrooms, but lodgings are not let where there is any family. The men go down at 6 A.M., and come up at 2 P.M.; but they do not work more than 31½ hours per week. At 8s. a day their earnings are 36s. Mr. McDonald was correct in saying that miners have returned from America. They will remain in Scotland while wages rule as at present; for though they earn more money in America, it does not go so far.

Examined by Mr. Grieve on railway accommodation, he spoke of great difficulties in that matter for the last 20 years. The trucks are provided partly by the railway companies and partly by the private firms. To Mr. Hussey Vivian he said that the Union does not interfere with the quantity of coal which a man cuts, but will not allow him to fill tubs out of his turn. A man who filled too many tubs was threatened with explusion from the Union, but he found no rule on the subject in the Union rules. He had not tried Courts of Conciliation or Arbitration. He failed to see on what principle they should be formed. The masters would be bound by an agreement with a delegate of the men, but the men would not be bound. The Mines Act added 3d. per ton at least to the price of coal. Collieries before the rise in prices had not been equal in return to other investments. His experience of coal-cutting machines was that they did not reduce cost, but reduced the number of men required. He had used an hydraulic machine by Carrat and Marshall.

Mr. Allan Gilmour, managing partner of the Burnbank, Ladyton, and Goatfoot Collieries, in the county of Ayr, and of the Maryport Iron Company, in Cumberland, said in the district the same men are hewers and drawers, drawing with their own hands the coals they cut, for a maximum distance of 600 yards. One-tenth of all the coal raised was slack or dross. The colliers' allowance is 16 or 18 cwts. per month, for which they are charged about half the market price. He assented to Mr. Pease's remark, that if deprived of cheap coal the colliers would want higher wages, so that the advantage of a change is "as broad as it is long;" but said that in some cases the allowance had been sold by the workmen at a profit. The men who work regularly work every day. The movement to shorten the hours of labour was suggested from external sources. He had heard disapproval of the movement expressed by the men themselves. A considerable body were discontented, but they felt bound to follow their leaders. On his part he objected to arbitration. In August, 1872, they had a meeting with the workmen; it was agreed that they should endeavour to arrange prices and wages at a certain rate, the colliers were to get 6d. for every shilling per ton advanced, and submit to a similar reduction for every fall in price. The arrangement worked beautifully so long as prices were going up, but the moment the reaction came, in November, 1872, and a reduction of 4s. was made in the price, which was duly explained to a meeting of delegates from the men, one from each colliery, they refused to accept the reduction of 2s. They said the masters had no right to reduce prices without consulting them. But they had not been consulted when prices rose. The result was that a meeting was held and arbitration proposed. Sheriff Bell, of Lanarkshire, was to be arbitrator. The delegates of the workmen promised that the men would resume work next morning, pending the arbitration. The agreement to that effect was signed by the Chairman on behalf of the masters, and by two of the delegates on behalf of the men. But at a meeting of the men held afterwards that arrangement was repudiated; they did not come to work next morning, and there was a strike of eight weeks.

COMMITTEE ON COAL.—Mr. Bennet Aitken, from the office of Messrs. Berger Spence and Co., of Manchester, London, and Glasgow, attended the Select Committee to give evidence. This is the well-known firm of merchants and brokers in chemical and mineral products, and its circular, in the preparation of which the witness is engaged, is largely used for reference by the trade. A notable difference was pointed out between some of the witness's statements, and those of Mr. I. Lowthian Bell, especially with reference to the quantity of coal used in the making of iron. The witness repeated the statement previously furnished to the committee by Mr. Meade, assistant keeper of the Mining Records, that 6 tons 7 cwts. are, on the average, consumed in converting into rolled iron the equivalent amount of ironstone. The statement is based on the opinion of the Coal Commission, but the President of the Iron and Steel Institute, who is himself a maker, gave the much lower estimate of 4¾ tons for bar-iron, or if a few hundredweight be added for rough casting, some quantity under 5¼ tons. The explanation, will perhaps, be found in the suggestion made by Mr. Carter, that Mr. Bell judged exclusively from the consumption in his own scientifically constructed furnaces, and the fact that improvements have been made since the Coal Commission issued its report, which is dated 1871. The item is of importance, because it is an element in calculating the extent to which the iron trade has effected the price of coal, and because in the opinion of many competent persons that trade is responsible to the full extent of the increase of price. There are two quantities to be added together—first, the quantity of fuel consumed in smelting ironstone, and so producing pig-iron; next, the quantity consumed in converting pig into rolled iron. Rough casting makes a third amount, and all these quantities are liable to be, and have been, confused with each other, and with their total amount. Again, coke is used in the process of making iron, and a ton of coke represents something more than a ton of coal. These considerations show the possibility of mistakes occurring in the computation.

LONDON GENERAL OMNIBUS COMPANY.—Traffic returns for the week ending June 15, 11,098*l.* 3s. 11d.

Meetings of Public Companies.

NOWDRIFT SILVER MINING AND REDUCTION COMPANY.

The half-yearly general meeting of shareholders was held at the company's offices, Finsbury-circus, on Wednesday,

The Hon. ASHLEY PONSONBY in the chair.

The SECRETARY read the notice convening the meeting, and the balance-sheet and reports of the directors and officers at the mines were then submitted.

The directors state that they have lost no time in giving effect to the purposes for which the capital has been raised, by paying off the liabilities, and vigorously prosecuting the operations at the mine. The progress made has been satisfactory, and the indications both on the Snowdrift and the Daniel Peters lodes are encouraging. According to the latest account, only 100 ft. remain to be driven in the deep adit, and 50 or 60 ft. in the eastern adit, before the lode is reached. The business of the mill has become so insignificant, and the produce of the mine likely to be so small for some months, that the manager thought it prudent to accept an offer for leasing it for four or eight months at a small monthly rental, coupled with the condition that the company's ores shall be crushed and sacked free of charge. It has been suggested in Colorado that a company should be formed to adapt the mills of this company and of the Silver Plume Company, which are contiguous, to the concentration of ores, by the erection of machinery, which has been found successful and highly profitable at the Caribou and other mines in the vicinity, and local subscriptions are offered towards the capital required. Should this project assume a definite shape it will deserve the serious consideration and support of this company, as being calculated to become a source of immediate and considerable revenue. The whole of the 600 debentures have been subscribed for, and believing it to be in the interest of the shareholders that the remaining 400 debentures should be issued they have entered into communication with those recipients of free shares who have not as yet assisted the directors by the surrender of shares applicable to the bonus, and have invited them to follow the liberal example of the promoters and others, and so enable them to complete the issue of additional capital to the proposed amount of 10,000*l*. The balance-sheet being made up to Dec. 31 exhibits only the receipt of 112*l*. 10s. on this amount; but the directors have remitted to Colorado out of subsequent receipts the sum of 1650*l*., whereby the whole of the debt to the bank has been paid off and funds supplied for the mining operations.

The report of Mr. Ernest Le Neve Foster states that during the six months ending Dec. 31, 1872, a large amount of work was done on the Snowdrift lode towards opening up and developing the mine, the greater part of which has been dead work, and consequently accounts to some extent for the loss shown in working the mine. Only 60 fms. of ground were stoped during the six months, and produced 21 tons of ore; the cost of stoping was $1260, or $21 per fathom. It may appear rather strange that the cost of stoping is so heavy in comparison to the cost of driving and sinking on the lode: but they remark that the process of saving the ore is very slow and tedious, as, being light and rich, it is necessary to spead sheets under it while it is being taken down, for unless great care is taken loss can easily occur. The crushing works have not been so successful as might have been wished; still, considering the outlay—$4000, the original cost of the mill and machinery—and taking the whole profits made at the works, $733·62, it will be seen that the profit is 18½ per cent. per annum, which cannot be considered very small; besides which it must also be remembered they crushed and sacked all their own ore at no expense. At the last general meeting of the company several remarks were made with respect to estimates on the probable profits of the mill. These, it is useless to say, were far beyond anything that has been realised; still they were made in good faith, but at the time those estimates were made he had only been one or two months in the country, did dot know the people with whom he had to deal, and relied too much on statements which now appear quite ridiculous. The amount of ore brought to such works as theirs is limited, as only those ores that are shipped to Europe or some of the Eastern states are crushed and sampled at their or similar mills, as when the miner sells his ore to the smelting and reduction works in the neighbourhood he sells it unerushed, so as to save all expense of crushing and sampling; therefore to get a large and continuous supply of ore, it is necessary to purchase ore, otherwise a regular supply can never be relied on.

The CHAIRMAN, in rising to move the reception and adoption of the report, observed that although, of course, they had not done as much as they could have wished the delay had been entirely owing to want of funds. About April they were able to forward money to Colorado, and their superintendent, Mr. Foster, had since made progress which he was sure they would all consider very satisfactory. The bank debt had been paid off, and they were now in a position to go on regularly. They hoped to cut the lode in about two months, and will then have proved the lower part of the mine. It was gratifying to know that as they went lower they were improving fast; and, as their lower level, or deep adit, was being driven into the hill, they also found considerable improvement. In all parts of the world it was known that lodes improved in going down, at least until a certain depth was reached. He hoped to be able to present a better account at next meeting, and the report which they had that morning received from Mr. Foster was decidedly more satisfactory. On the Daniel Peters section they were driving, and all was looking well. An advantageous arrangement had been entered into with the Silver Plume Company, whereby they take half the expense of Mr. Foster and half that of Capt. Johns, so that there would be an important reduction in the item of salaries. The crushing-mill had been let upon an agreement that the arrangement should terminate on three months' notice. By this they not only got 6*l*. per month, but were saved the expense of keeping their own people, and had the right to have all their own ore crushed for nothing. Of the value of the ore there was no doubt; much of it had yielded $180 per ton, and some as much as $265 per ton. All that they wanted was to get the ore in quantity, and this he hoped they would now be shortly in a position to do. It was gratifying to find that Mr. Old had endorsed all the recommendations of Mr. Foster. He reported that if they had had more money he would have advised the adoption of a more extensive plan of operations; but, under present circumstances, Mr. Old considered it best to follow the recommendations which Mr. Foster had made. It might be satisfactory to the shareholders to learn that letters received in this country stated that Mr. Daniel Peters had purchased all the interest of the Trenton Mining Company, and also that he had taken 200*l*. of the debenture bonds of the Snowdrift Company, which was particularly gratifying, as showing his confidence in the mines and district. He was not aware that he had anything further to mention, but would be glad to answer any question which shareholders might wish to ask. He concluded by formally moving the reception of the report and accounts.

The following report from Mr. Ernest Le Neve Foster was received this morning:—

May 29.—The deep adit has again got into a hard bar of ground; we shall drive about 21 ft. this month, and shall probably be obliged to advance the price of driving it next month. We purpose offering the men a contract to cut the lode now distant about 90 ft. at $19 to $20 a foot. The eastern adit is steadily progressing, ground of much the same character as when last reported on. No alteration in the whim-shaft. Daniel Peter's Mine: The C level shows some improvement, and is progresing favourably; we hope to be able to make a reduction in the price of driving next month. A slight improvement both in ground and character of the lode is visible in the H level.

Mr. FOX said there was only one remark which he had to make, and he made it scarcely by way of complaint, that the accounts were only made up to the end of December, whereas he thought they might have been made up to the end of March.

Mr. MORGAN explained that the accounts were made up twice a year to December and June, and that it was owing to an exceptional circumstance that there was so long an interval between the closing of the accounts and the holding of the meeting. In the ordinary way the meeting would have been held at the end of April or beginning of May, but it had this time been delayed, as the directors were desirous of having something to communicate to the shareholders. Until they had the report from the mine they had really nothing to communicate, and they would see from the late date of the report that no time had been lost since it came to hand.

The CHAIRMAN, in reply to a shareholder, stated that the bank debt in Colorado had been paid off, which was important, as the interest paid out there was enormous. They had themselves been paying the bank 25 per cent. interest, and it was thought that they had made a very good bargain.

A SHAREHOLDER enquired why the shares which were in arrear of calls were not forfeited?——Mr. MORGAN said the amounts due were all considered good, and the directors thought it better to give a little more time than to forfeit.

The CHAIRMAN said the directors had given the matter every attention, and would continue to do so.

The report and accounts were then unanimously adopted. Messrs. Ponsonby and Kershaw were re-elected directors; and Messrs. Waddell and Co. were appointed auditors, the sum of 10*l*. 10s. being voted to them as remuneration.

An extraordinary general meeting was then held to consider the resolution confirming the arrangements for loan, and to approve drafts of mortgage and mortgage debentures.

Mr. MORGAN explained that as their counsel considered that as the issue of mortgage debentures was an important matter, they should have a formal confirmation of all that was done—the arrangements approved and sanctioned, and the documents approved. It would probably be unnecessary to read the whole of these, as they were necessarily of a very technical character, if he explained that the nature of the documents was a mortgage to trustees on behalf of the general body of debenture holders, the trustees named being Messrs. Ponsonby, Young, and Milnes. The deed was prepared to secure debentures to the extent of 10,000*l*., for although at present only 6000*l*. worth of debentures had been subscribed for, the directors proposed to place the remaining 4000*l*. as soon as possible, and thus put the company in a good financial position. The mortgage was prepared to secure all the debenture-holders' rights, and gave all usual powers. Then there was the form of mortgage debenture. And thirdly, there was an agreement authorising the issue of shares to debenture-holders in the event of their desiring to exchange their debentures for shares. This was necessary, as a contract was involved, which, according to the Companies Act, 1867, required to be registered with the Registrar of Joint Stock Companies.

The details of the documents were discussed, some slight verbal amendments made, and Dr. Henry Smith's name was added as a fourth trustee. The documents were then unanimously sanctioned and approved.

The CHAIRMAN expressed the hope that the shareholders would come forward and subscribe a little of the remaining 4000*l*. of debenture capital, reminding the meeting that if the whole amount were taken *pro rata* it would amount to only 8 per cent. of their present holdings. He trusted the amount would be forthcoming by the end of the year, as the work would progress much more favourably at the mine if they had funds in hand. As to Mr. Old's report, it was to a certain extent very satisfactory, for although in some of the upper levels the results were not so satisfactory as was anticipated, this was amply compensated for by his opinion as to the lower levels. Mr. Old recommended them to go on in depth, and as they were driving east and west in the hill-side they would save the cost of raising ore through shafts, and would be able to work the mine very economically.

On the proposition of Mr. MILNES, seconded by Mr. COCKETT, a cordial vote of thanks was given to the Chairman and directors, and this having been duly acknowledged, the proceedings terminated.

NORTH AMERICAN GOLD MINING COMPANY.

A special meeting of the shareholders was held at the Cannon-street Hotel, on Wednesday,—Dr. H. J. STALLARD in the chair.

Mr. MAY (the secretary) read the notice convening the meeting.

The CHAIRMAN said that in December last, when he had just returned from visiting the mine, he reported there was a very large quantity of ground which had been sampled by him, and proved to be extremely rich in gold. He also stated that upon the presence of a sufficient quantity of water the return of the gold depended. The season, however, had failed to supply a sufficient quantity of water to wash the gravel, as it was not till the beginning of March that a telegram was received that the water was available, but at the end of another week a considerable quantity of gold was realised, and a bar had been sent off of the value of 2000*l*., which might be regarded as so much profit. A few days afterwards another telegram was received stating that the supply of water was falling lamentably deficient, and that it was feared they would not be able to continue to wash gold from the gravel. It so happened that Mr. Simson, a shareholder, was at the mine at the time. He remained with Mr. Morgan four days, and had given a very excellent account of the results of his visit. He says:—

In accordance with your kind suggestion, I have availed myself of an opportunity of paying a visit to the North American Mine. In consequence of the bad state of the roads, and the prevalence of the epizootic, I had some difficulty in getting up to the property. From my fellow-travellers (all of whom were interested in mining) I learned that, with the exception of the season of 1863, the present one was unprecedented in the experience of the oldest inhabitants of the Sierra Nevada Mountains, and that the prospects of the present water season were very bad. In November and December rain usually falls there, but in those months last year there was not a shower. Snow commenced in February, but the fall was not nearly so deep as usual, and the ground being hard, and the snow very light and dry, it was expected it would melt rapidly. On my arrival your superintendent, Mr. Morgan, received me most cordially, and fully confirmed the extremely unfavourable opinions I had heard expressed as to the prospects of the water season. During my stay of four days at the mine the snow disappeared in the most remarkable manner—it would seem to evaporate rather than melt, for, although on some mountains facing south it has entirely disappeared, the increase of water in the ditches is inconsiderable. Should there be no further snow or rain storms—which, although possible are not probable—after April, Mr. Morgan is fearful the water will not hold out sufficiently long to enable him to wash up more than half the gravel he has got out upon the dump. The present pipe would throw about 70 in. of water, but at present there are not more than 40 in. running, or little more than half a head, and more than this quantity cannot be looked for this season. The average quantity of water in ordinary seasons is about 1000 in., with which supply all the gravel which could be got out in the dry season might easily be washed up in a few weeks. This season there has never been more than 80 in. The drift mines, however, are far more fortunate than the neighbouring hydraulic mines, which can do little or nothing this season. Since my visit to the mine last September a prodigious amount of work has been done, and great improvements made to the property. The tunnel has been widened, and is now one of the finest I have ever seen; a double track has been laid down, and the cars which formerly were pushed by Chinamen are now drawn by a mule. By this new arrangement more than double the quantity of gravel may be taken out than under the old system. The tunnel is now in about 2300 ft., with main gangways of about 280 ft., and sub-gangways extending from them of from 200 to 240 ft., running the same course as the main tunnel. The work is all done in the most substantial manner. Mr. Morgan has had considerable difficulty during the winter, arising from the disaffection of the white men and their opposition to the introduction of Chinese labour. For the space of four months he had a standing advertisement for white men in the Sacramento paper, but only four men presented themselves for employment, neither of whom remained more than a few days. Of Chinamen the supply has not been abundant. Mr. Morgan is of opinion that these difficulties about labour will not occur again. He had now only about 14 white men and 120 Chinamen. The whites are all good steady men; the idlers and turbulent men have all left the place. He has an excellent foreman, who has been with him for a long time, and upon whose ability and integrity he can most implicitly rely. The mine is getting into favour with the Chinese, and they seldom leave of their own accord. Around the mine they are building and purchasing houses for dwellings and for stores, and in this way investing a great deal of money, the effect of which will be to induce them to remain.

The number arriving in this country is yearly increasing, and Mr. Morgan anticipates that in future he will be able to procure as many as he may require. When they first arrive they have to be taught their business, as very few have ever before worked underground, but after a few weeks they make good workmen, are very ingenious, and are more easily controlled than the white men. The average pay of the whites is $3·50, while that of the Chinamen is $1·60. Of your superintendent, Mr. Morgan, it is impossible to write in too high terms. Those who are unacquainted with the difficulties of his position cannot do him justice. The result for the present year would have exceeded his promises had there been an ordinary season. The gravel is on the dump, but water to wash it is wanting. In any season for the last 20 years, with the exception of 1863, there would have been an ample supply of water, not only to wash the whole of the gravel upon the dump, but to continue for two months from the present time washing gravel faster than a force double as large as at present employed could get it out of the tunnel. On my visit to the mine last year I took from what I was told was the richest part, a breast in the tunnel, a sample, which I washed, and obtained very large gold. I knew it was a picked sample, and I did not expect to see gold of the same size, but the day after my arrival the water was turned off, and the flumes washed up, and I found my sample below the average. I picked from the flumes many ounces of pure gold, some pieces weighing more than 2 ozs. Nearest the bed rock the gold is very large, and had it been possible to have foreseen the extraordinary scarcity of water Mr. Morgan would not have worked the breasts as high as he has done, and the average yield per car load of the gravel washed would have been much higher. In conclusion, I may say you may assure your shareholders that however disappointed they may be at the run for this season the property is inexhaustable for very many years, is spoken of by those acquainted with it as one of the richest and best-managed properties in California, and but for the exceptional season would have given a return exceeding the most sanguine expectations of those of the directors who have examined it.

The water season had for some years past commenced in March, and continued until July. This is the real condition in which the company is now placed. Before his return to this country, and before the directors had received any confirmation of the *bonâ fide* value of the property, the board had conferred with the vendors in respect of the assurance of dividends to the shareholders, and he could state that the vendors had met them in an extremely liberal spirit. They agreed to place in the hands of two gentlemen, as trustees of the company, 20,000*l*. worth of shares (5000) for the payment of a dividend of 20 per cent. on June 30 of this year; the trustees were endowed with power to sell these shares for the purpose of realising this dividend. There was, however, no doubt in the world as to the *bonâ fides* of the vendors, nor as to their confidence as to the payment of a dividend, or they would not have consented to make this very great sacrifice. The agreement was surrounded with certain conditions—one of which was that they were not to be held responsible for the non-realisation of a dividend if it arose from circumstances over which they could have no possible control. Now, it was clear the vendors could not be held responsible for the extraordinary famine of water that had occurred; and after some negociations the vendors met the matter in a very liberal spirit, by consenting that the agreement should be cancelled, that the 5000 shares should be cancelled—which is one quarter of the capital of the company—and that they should be re-issued as perpetual deferred shares, without participation in dividends until the ordinary shares shall have received 10 per cent. per annum. Considering the company had no legal claims whatever upon the vendors to make such a sacrifice, and that the delay had arisen from causes over which they had no control, it must be regarded as a satisfactory assurance that they firmly believed in the value of the property. He hoped the shareholders would take this as an evidence that the directors had not been unmindful of the company's interests. As to the future, although the directors were not at present in a position to state that the 2000*l*. could be treated as profit, they had no doubt upon the point, but the accounts had not yet arrived showing that the legitimate expenses of the mine and advances made from the working capital had been reimbursed; labour and store expenses had been the principal items. Mr. Simson spoke of Mr. Morgan in the highest terms. It was proposed that for the present the 2000*l*. should be kept in hand. He was going out to Salt Lake City, in a week or ten days, upon other business, and the directors had asked him to go forward and consult with Morgan upon one or two of the most important points—the means of husbanding and storing the water, and availing themselves of the best supply of water that could be obtained. They had every guarantee as to the quantity and richness of the gravel, and all they had to regret was the unforeseen difficulty of the water famine, which no one could have foreseen. Under these circumstances, it was left entirely to the shareholders to say whether they would support the views and policy of the directors. The statement of Mr. Simson, "that however disappointing the results this season, the property is unexhaustible for many years," could not fail to be most encouraging, as Mr. Simson was an independent shareholder, and went to the mine *con amore*, without any solicitation or authority from the board. He (the Chairman) hoped that before another year they would be in a position to declare something more satisfactory. (Hear, hear.)

Sir FRANCIS LYCETT thought it would have been more satisfactory if the directors had obtained the information as to the amount of gravel that had been washed, and that accumulated.

The CHAIRMAN said it would have been very satisfactory to have been able to communicate such information. All they could say was that Mr. Morgan had not been able to wash more than one-half the amount accumulated. The accounts were hourly expected from Mr. Morgan.

Mr. HOLDSWORTH said from his personal knowledge of Mr. Simson he had the highest confidence in the opinion he had expressed with regard to these mines. Mr. Simson was one of his oldest friends, and he could assure the meeting that the statements contained in his letter were fully borne out by letters he had personally received from him. Mr. Simson expressed the utmost confidence in the future of the mine, and also as to the richness of the ore, and the manner in which it is being worked, and Mr. Simson was not a man who took sanguine views. In general character being rather in an opposite direction. He (Mr. Holdsworth) believed the directors were doing the best they could for the shareholders, and he had very great pleasure in moving that the meeting begs to express its confidence in the directors for the judicious and satisfactory course adopted in their arrangement with the vendors.——Mr. OLIVER MAY seconded the proposition, which was put and carried.

Mr. SHUTER (a director) mentioned that he had that morning received a letter from a private friend, who stated that the mines were producing largely, and that Mr. Morgan was working more than 100 Chinamen, besides white men, and that the general impression was that the most sanguine anticipations would be realised this season.

A SHAREHOLDER then proposed that the Chairman, on his visit to the United States, be requested to visit the property of the company, with the view of carefully considering the position of affairs out there, and obtain the advice of and consult with Mr. Morgan as to the best means to be adopted to secure a continued supply of water, so as to work the property as an hydraulic mine.

Mr. BARTRUM seconded the proposition, adding that the directors had considered it their duty to solicit the aid of their Chairman, and had voted him the sum of 100*l*. for his expenses.

Mr. BUCKERSTAFF said that a question of confidence in the board should never have been mooted, as it was only a feeling of disappointment.

The CHAIRMAN said the board had resolved to ask the shareholders to meet them that day, in order that they might obtain its moral support for his visit to the mine. In reply to questions, he stated that the actual capital was expended by about the first payment for labour account, in December. Mr. Morgan had carried on the mine during February and the greater part of March, apparently by owing the workpeople money, and partly from his own resources, and it was utterly absurd to suppose he did not pay those things back before sending over the gold. As whether they would have money enough to make the necessary improvements was a question that could not then be discussed.——The resolution was put and carried.

A vote of thanks to the Chairman and directors terminated the proceedings.

KAPUNDA MINING COMPANY.

The fourteenth annual general meeting of shareholders was held at the offices, Great Winchester-street, on Monday,

Mr. B. H. PEARSE in the chair.

Mr. R. GALT (the secretary) read the notice convening the meeting.

The report of the directors (which appeared in last week's Journal) was taken as read.

The CHAIRMAN said he had extremely little to bring before the shareholders. The colonial accounts were in so small a compass that he need not trouble the meeting with any remarks upon them, except to mention that the only difference as compared with former years being in the merely accidental circumstance as to the date that rent was received from their lessees—whether it was received before or after the accounts were made up. This year it was received just after the balance-sheet was made up, and out of which it was proposed to pay the dividend. The mine, generally speaking, had been conducted much the same as last year—there had been no very great developments. Their lessees had conducted the smelting furnaces in a more economical manner than they did the previous year, so that, as far as the working goes, it was satisfactory. The precipitate process had been worked for some time at a profit, and was so continuing until March, but the small result under that process (49 tons of pure copper) showed that there was little stuff to be worked by that process. By the other process 262 tons had been produced, against 268 tons the previous year. They must anticipate lower prices than last year, and the only question was whether the "raise" of copper would make up for any decline in price. As mentioned in the report, the main working had been the unwatering of the lower levels, but a discovery had been made upon what was called Hart's lode, which, although producing ore, was not equal to their anticipations. A considerable amount of ore ground existed near the surface, and with a view of further developing it boring apparatus upon an improved construction had been sent out. There was no doubt they were in the hands of most honourable men, and there was no reason whatever why the accounts furnished could not be accepted in the same way as the cheque they sent. He then moved that the report and balance-sheet be received and adopted.

Mr. STOPFORD seconded the proposition, which was put and carried.

A dividend of 6*d*. per share was declared, free of income tax.

Mr. Stopford was re-elected director, and Mr. Noble auditor.

A vote of thanks to the Chairman terminated the proceedings.

LLAY HALL COAL, IRON, AND FIRE-BRICK COMPANY.

The statutory meeting of shareholders was held at the company's offices, 173, Fenchurch-street, on June 13,

Mr. F. BENNOCH (the Chairman) presiding.

Mr. HERBERT R. DUKE (the secretary) read the notice convening the meeting.

The CHAIRMAN explained the object of the meeting—to comply with the provisions of the Companies Act, 1867. He stated that the directors took possession of the property the first week in April, and having been exceedingly fortunate in meeting with a competent engineer and manager (Mr. Clark), thoroughly familiar with the works and district, proceeded to place the machinery attached to the colliery, ironworks, and brickworks in working order, and to pump the water from the pits already sunk to within a few yards of the first seam of coal. The whole of this work, variously estimated to cost from 500*l*. to 1000*l*., and to take from three to six months to perform, had been done in a month for the trifling sum of about 200*l*. The difficulty of the strength of the water had been greatly exaggerated. He pronounced the property far superior to the description given of it in any of the reports attached to the prospectus; he was able to assert this from personal knowledge and actual working. The two present pits would be sunk to the coal at once; meanwhile the directors had secured an additional adjoining royalty of 70 acres, from the surface seams of which on the outcrop an immediate supply of coal for the use of the colliery engines, ironworks, and brickworks might be obtained, and a considerable quantity for sale in addition. There are about 150 acres of coal to work from the two present pits (estimated to contain from 3,000,000 to 4,000,000 tons), from which it is expected a daily output of 500 tons will shortly be obtained. Two new pits in the course of next year will be sunk on the large royalty of 528 acres (calculated to contain further 15,000,000 tons of coal), so that when all four pits are being worked simultaneously the collieries will probably be the largest and most productive in North Wales. He (the Chairman) stated that the ironworks (for the manufacture of sheets, &c.), with ample water-power and fuel on the spot, were now ready to be let, and that there had been several applications for them, but that it was not yet quite decided if they should be let or worked by the company. The brickworks were ready to start, and besides a constant supply for the company's own wants a considerable quantity of clay goods would be put in the market. It was also stated that railway communication from the works to the Wrexham, Mold, and Connah's Quay Railway (about half a mile distant) would be effected by one of two alternative routes which had been arranged for; this would give railway and shipping facilities to all parts of the world. He concluded by congratulating the shareholders on the possession of so admirable a property, the value of which was doubled since they commenced to work upon it, which views were confirmed by a shareholder present who had visited the works.

In reply to a question, the CHAIRMAN stated that hitherto all the shares taken had been privately subscribed, and that there was ample capital in hand after having paid for the property for 12 months to come. At the suggestion of a shareholder, however, it was decided to offer 750 further shares of 10*l*. each to the present proprietors and their friends.

Capt. GIFFARD moved a cordial vote of thanks to the Chairman and directors, and hoped they would continue their successful efforts on the company's behalf.——Mr. PAGDEN seconded the resolution, which was carried unanimously, and the meeting separated.

The following is an extract from Mr. CLARK's report of June 11:—

THE COLLIERY.—Now that Griffith's minerals are secured to the company there are about 150 acres of coal to work from the present pits, which, allowing for faults and waste, are estimated to contain upwards of 4,000,000 tons of coal; the output from these pits should not be less than 500 tons per day, or 125,000 tons per annum. In order to supply our immediate wants, and to provide fuel for the ironworks and brickworks, I propose working two of the three upper seams, one of whose outcrop is seen in the wood; from these two seams, which have a combined workable thickness of 7 ft., I shall be able not only to supply our own wants, but a considerable quantity for sale. I have not yet selected site of proposed new pits on the large

yalty of 528 acres, which is estimated to contain a further quantity of 15,000,000 ns of coal, but I shall give the matter my early attention, and anticipate no dif- ulty with this work. When coals are being raised to their full extent at the four s simultaneously, an output of 2000 tons a day may be expected, and I have no sitation in saying that you will have the finest colliery in North Wales, if not in the Principality.

THE IRONWORKS.—All the machinery has been put into working order for the ent sum of 120*l.*; these works, with water-power and fuel on the spot, are ready be let at once, and should produce a large rental, or with workmen's tools, pig- on, and other stores should be made, if worked judiciously by the company, to duce a considerable profit.

THE BRICKWORKS.—A new tunnel has been driven into the fire-clay, of which ere is an inexhaustible quantity of very superior quality. The machinery and s have been put into working order at a trifling cost of 115*l.* I shall be able, in dition to supplying our own wants, to put into the market a considerable quan- y of fire-brick and other clay goods. We start brickmaking on Wednesday next.

conclusion, I may say that I am very sanguine of success at all points, believing t you have a most valuable and lasting property, and I assure you that no effort 'll be wanting here to develope the property with the utmost possible dispatch.

E. S. CLARK, Agent and Engineer.

LITTLEDEAN WOODSIDE COLLIERY COMPANY.

A general meeting of shareholders was held at the Townhall, Wood- e, on Wednesday,—Mr. EDWIN CRAWSHAY in the chair.

The SECRETARY read the notice convening the meeting, and the subjoined report of the directors was submitted:—

The directors have completed the purchase and taken possession of the Heywood d Addis Hill Collieries, and have also bought the Smith's Delight Colliery at the m of 1500*l.*, and part of Richard White's Colliery at 2000*l.*—properties which m an important addition and enhance the value of Heywood and Addis Hill. e necessary works for the development are progressing favourably, and within a ort period an output of coal will be gained. The share list closed on June 17, ving 900 shares unsold. The directors do not propose to place any of these shares on the market, it being deemed more expedient to raise any moneys which may required for colliery purposes by a temporary mortgage. The directors adhere the statement contained in the prospectus, that at an outlay not exceeding 8000*l.* h an output of coal from these collieries may be gained as to insure a dividend more than 15 per cent.

Upon the proposition of the CHAIRMAN, seconded by Mr. DRAGE, e report was unanimously adopted; and Mr. J. Perran, who retired rotation, was re-elected a director.

The proceedings terminated with the usual complimentary vote thanks to the Chairman and directors.

SOUTH CONDURROW MINING COMPANY.

The general meeting of shareholders was held at the company's ws, Austinfriars, on Thursday,—Mr. JOHN FIELD in the chair.

Mr. J. HICKEY (the secretary) read the notice convening the meet- g, and the minutes of the preceding one. The statement of accounts as then submitted, showing that the total cost was 7988*l.* 4s. 9d.; e tin sold realised 9749*l.* 12s., and the copper ore 42*l.* 9s. 6d., making 192*l.* 1s. 6d. in all, and leaving a profit on the four months' working 1803*l.* 16s. 9d. Adding to this the balance brought forward from account of 611s. 11s. 3d., there would be an available balance of 1354*l.* 8s.: but, in accordance with the suggestion made at the last eting, an extra month's cost was charged, so that the balance to carried forward would be 26*l.* 13s. 5d.

Capt. VIVIAN then read the subjoined report:—

June 17.—Since the last meeting of shareholders we have completed the arrange nts then alluded to for sinking King's shaft below the 93 on West Basset lode, d have sunk the shaft 6 ft. below the level. The sumpmen have now taken a ntract to sink the shaft to the 103 for 25*l.* The shaft is in granite, the lode ving dipped to the south of it, but this change in the underlay is very slight, d we, therefore, think it best to continue the shaft in the usual course, which is y nearly perpendicular; the granite through which we are sinking is of a vourable character for the production of metals. We have also commenced driving h, west of King's shaft, on West Basset lode, the end being now 37 fms. st of the shaft, where the lode is 2½ ft. wide, composed of ferruginous flookan d quartz, carrying a little tin. We shall push this end on towards Vivian's shaft the close of there cross-cutting north and south.—Tin Lode: In the 82, west King's shaft (now 53 fms. west of shaft), the lode is 5 ft. wide, and worth about per fathom. In the same level, east of cross-cut, the part of the lode which have been carrying is 6 ft. wide, and worth about 10*l.* per fathom. The 71 has en driven west to Vivian's shaft, where the lode is 15 ft. wide, and worth about per fathom. Vivian's shaft has been sunk 2 fms. below the 61 on West Basset e, where we have been obliged to suspend further sinking on account of the kness of the water, but we hope to be able to resume it in the course of a week ys, and to continue it through to the 71 on the tin lode, which will afford a nsiderable advantage to the working of our western tin ground. In the rise going in the back of the 71 against Vivian's shaft the lode is worth about 35*l.* per fm. s a width of 7 ft.

In No. 2 winze, sinking under the 71, west of King's shaft, and now down 11 fms., lode is 5 ft. wide, and worth about 30*l.* per fathom. The 82 end is now down m this winze. At the 61 we had commenced driving east of the cross course, d King's shaft, just before the last meeting, and were then able to report fa- urably of the lode in going into this unexplored part of the sett, being then of e value of 8*l.* per fathom, with the appearances indicating further improvement. have great satisfaction in now stating that this level has since gone on steadily proving, so that the part of the lode which we are carrying, which is 6 ft. wide, now worth 60*l.* per fathom. This certainly is one of the most important and mirable points in the mine, seeing that there is no level either over or under 61, and that the lode by its bearing is going further into the central part of the t in going east, whilst the distance it will have to traverse in our ground in an erly direction is more than 300 fathoms. The 71 has been driven east of King's ft to the cross course, and the tin lode discovered. We shall now drive this t east after the 61, with the hope of as good results as those met with in the latter. the 61, west of King's shaft, we drove at first on No. 1 north branch without ding the tin lode, which was to the north; we have since driven a cross-cut north fathoms, of which the last 10 fathoms have passed through the lode, yielding ttle tin, and worth in parts from 10*l.* to 12*l.* per fathom; we have not yet reached north wall of this lode.

In the 51 fm. level we are sinking to communicate with a rise put up from the in order to afford ventilation, and facilities for stoping. When this is done we shall also push this level east and west. We are driving the 20 fm. level east and rth of Fraser's shaft, where we hope to make discoveries of value in the eastern rtion of our ground. In going east this level will soon be passing under good ground which we have worked in the 10 and deep adit levels. At the Plantа- n shaft we are driving the deep adit west, where the lode has lately been im- oving, and is now 1½ ft. wide, yielding rich stones of tin. We are also driving e same level south, to intersect our south branches. We are driving the shallow it east, west, and south, and having been successful hitherto in opening up valu- le tribute ground at these shallow points on several branches in this part of the ne, we expect to continue to do so.—Middle Lode: In the 10 fm. level, east of lliam's shaft, we are cross-cutting north to the main part of the lode, having out 6 ft. more to drive to intersect it. In the deep adit, east of the same shaft, lode is 1½ ft. wide, and worth about 8*l.* per fathom. In a winze sinking from e deep adit to the 10 fm. level the lode is 1½ ft. wide, and worth about 8*l.* per thom. It is important to notice that this lode will drop into the great tin lode fore reaching the 61 fm. level, and that it has yielded good bunches of tin for a gth of 60 fms. before the present 61 end going east on the great tin lode. In ving a shallow adit east of junction shaft the lode is 2 ft. wide, worth about 12*l.* fm. The sinking of the junction shaft will be resumed with as little delay as pos ble. We have broken and dressed since last meeting about 120 tons of black tin, of ich 96 tons 19 cwts. 3 qrs. 27 lbs. have been sold, and the balance is ready to be d at any time when it may be thought advisable to do so. This is the produce four months. The great increase in the cost of working caused by the high ice of materials and labour, and the drop which has taken place in the price of , have prevented our doing better, but we trust that circumstances more favour- le for the shareholders may arise, and enable us to realise better results. From esent appearances, we are likely to keep up our present return of tin; and as it possible that the price of tin will again advance, whilst materials, &c., used in ining will be cheaper, we can look forward with confidence to resuming and con- uing to give good dividends.—J. VIVIAN AND SON, W. WILLIAMS, H. ABRAHAM.

The CHAIRMAN remarked that there was but little to be said with gard to the position and prospects of the undertaking; but it might well to mention as evidence of the value of the mine that taking four months' ore against four month's cost they had earned a divi- end of 5*s.* per share, and although no dividend was paid, the finan- ial position of the concern was so much improved by bringing up n extra month's cost that he believed they would receive an equi- alent advantage. The profit earned had been 1800*l.*; and, as the rice of tin was now advancing, whilst coals and some of the mate- ials required at the mine could be purchased more cheaply, he con- idered that altogether they were in a very satisfactory position. He would be glad to answer any questions which shareholders ight wish to put, and as Captain Vivian was present they could btain from him any particulars they desired with regard to the work- ng of the mine.

Mr. WALTER enquired whether it was deemed advisable to sell their tin as they duced it, or to store it and wait for a better market?

Capt. VIVIAN said that during the first part of the period embraced in the accounts appeared so uncertain what course the market would take that they thought it best to sell fortnightly, but subsequently there was a better feeling, and they com- unicated with the directors to ascertain whether they should hold back their last parcel of 23 tons or sell it. The directors authorised them to use their discretion in the matter, and using that discretion they had held back. They had every reason to be satisfied with the result, for there had yesterday been an advance of 3*l.* in the tin standards, and that represented an improvement of 1*l.* 15*s.* per ton upon the price they obtained for their tin. There was of course some difference of opinion as to the probable movements which would take place in the market, but he and many others had full confidence in further improvements taking place. He believed the price would go to 100*l.* per ton, and had expressed that opinion to many persons.

Mr. WALTON enquired what was the average monthly cost, and whether it was intended at any future time to bring up the cost any closer?

Mr. HICKEY said that the cost averaged 1900*l.* to 2000*l.* per month.

Captain VIVIAN said they had for some time been trying to bring up this one month's costs, and had now succeeded in doing so. They would hereafter bring up another month, but it was not proposed to do so at the next account.

Upon the proposition of Mr. WALTON, seconded by Mr. FRASER, the report and accounts were unanimously received and adopted; and upon the proposition of Mr. SARGEANT, seconded by Mr. MARSHALL, the committee were re elected.

The CHAIRMAN was not aware that there was any other business before the meeting, but he might remark that their prospects were very favourable, and that they were much indebted to Capt. Vivian for the energy with which he conducts the mine.

Capt. VIVIAN, in reply to questions, stated that the costs would remain at about 2000*l.* per month. The cost of materials might be reduced, but he did not anticipate any reduction in the cost of labour; there had been 20 per cent. advance since last year. There had been a reduction in coal from the highest price of 12*s.* per ton, but they were still paying 24*s.* 6*d.* per ton for coal of the same quality as they purchased four or five years ago for 15*s.*, and they used 220 tons per month. At present their tin, including cost of dead work, cost them 65*l.* per ton. They would not know the value of the West Basset lode until they reached the 103 fathom level, when it would have passed from the killas to the granite.

The proceedings terminated with the usual complimentary vote to the Chairman.

GREAT WHEAL VOR UNITED MINING COMPANY.

The quarterly general meeting of shareholders was held at the offices, Gresham House, on Thursday,—Mr. J. O. HANSON in the chair.

Mr. J. J. TRURAN (the secretary) read the notice convening the meeting, and the minutes of the last were confirmed.

The report of the committee was read, as follows:—

June 19.—At the last quarterly meeting, when the committee had the pleasure to meet their fellow-adventurers, the discovery of the lode at the 164, west of Edwards' shaft, was in doubt; but this point, to which the committee have looked forward with interest for such a lengthened period, has happily now been ascertained; the lode at this level not only having been found, but productive for the length upon which it has been driven, and at the present moment it is opening out with every appearance of permanent improvement. This, as the shareholders are aware, is probably the most important point as bearing on the future productiveness of this part of the mine. The 174 is also improving as it gets further west from the first limb of the cross-course. In the eastern ground the committee are also happy to report that although the 184, east of Metal shaft, has fallen off in value through the intersection of apparent branches of a cross-course, yet the lode in the 174 has decidedly improved, whilst the 194 show signs of approaching the course of tin which was so productive in the level above. Thus five levels, three east and two west, progressing so well, have not only enabled the committee gradually to increase their monthly sales of tin, but at the same time to add to the reserves available for the future. The cost of coals still remains very high, and it is feared there will be no sensible reduction in price for the present. As a measure of precaution, the committee have entered into negociations for a licence to work the ground adjoining the eastern portion of the mine, should they think it desirable to do so, but the shareholders may rest satisfied that the committee will take no further steps without mature consideration.

Although the financial state of the company is not so satisfactory as the committee had ventured to hope on the last occasion, owing to a fall in the price of tin, yet it will be seen from the following statement of accounts that the balance has been reduced by about 270*l.* The following is the state of the accounts this day:—

On the publication of the audited accounts to April 30 last there was a balance in hand of				£ 234	17 4
Since which date there has been received—					
Tin sale in May			1943	19 0	
Ditto in June			1966	18 8	
Tribute and royalty on tin sold from leavings			89	1 2	
Sundries, &c., sold at the mines			29	6 9	= £4285 2 11
And paid—					
Labour pay for four weeks ending April 26			£1129	15 3	
Merchants' bills			744	7 8	
Sundries, discount, postage, &c.			13	17 11	= 1888 0 10
Leaving a cash balance in hand of					£2397 2 1
The actual account stands this day as follows:—					
LIABILITIES.					
Labour four weeks, to May 24			£1062	5 3	
Merchants' bills unpaid			1126	10 4	
Lords' dues unpaid			373	12 10	
Salaries three months			86	0 0	= £2648 8 5
ASSETS.					
Cash balance in hand as above			£2397	2 1	
Old materials sold, but not yet paid			80	0 0	= 2477 2 1
Leaves balance against the mine					£ 171 6 4

In conclusion, the committee think they are fairly justified in congratulating the shareholders on the improved position of the mine, as evidenced by the gradual increased sales of tin, which are being effected without any undue pressure on the reserves.

The report of the agents was read, as follows:—

June 18.—In the 184 driving west of Edwards's engine-shaft we have intersected the slide within the last 9 ft. driving; the lode is still disordered by its influence, but is producing low quality tinstuff. In the 174 driving west between the two limbs of cross-course we have lode and branches 3 ft. wide, worth 40*l.* per fathom; here we expect to intersect the western part of the cross-course in about 2 fathoms more driving. In the 164 we have opened nearly 3 fms. on the lode west of the last limb of the cross-course, and as we get west from the cross-course we find both ground and lode better defined; the lode in the present end is 1 ft. wide, worth 12*l.* per fathom, and at present it presents every prospect of further improvement; it is letting out strong water, which we always regard as a good indication. We have just resumed the driving of the 152 west of the cross-course; here we have not yet seen the lode, but, from the position of it in the level below (the 164), we expect to meet with it soon; the ground looks very congenial for tin.—Metal Engine-Shaft: The 194 is driven 2 fms. east of No. 4 winze, which has just been communicated from the 184; the lode in this end is small and poor; this end is now within 8 fms. of No. 5 winze, where we have a lode 2 ft. wide, worth 100*l.* per fathom, therefore we look forward to an improvement in this level soon. In the 184 driving east we have met with several small branches of the great eastern cross-course, hence there is a considerable falling off in the value of the lode here during the past month, and it is now worth 20*l.* per fathom; we expect that this end is now within a short distance of the main part of the cross-course, and we shall, probably, find no settled ground or improvement in the lode until we get to the east of it. A winze sinking below this level 12 fms. behind the end is down 6 fms., and on lode and branches 3 ft. wide, worth 100*l.* per fathom. A rise above this level 10 fms. from the end is up 6 fms., and on lode and branches 3 ft. wide, worth 70*l.* per fathom. In the 174 we have a large and well defined lode, worth 40*l.* per fathom; this level has opened up a quantity of good payable ground that can be taken away to good advantage as soon as the rise is communicated from the 184. During the past month we have cleared and secured the 164 from shaft to the present end, and shall resume the driving of this level next week on a payable lode. We have a quantity of tribute ground standing in the back of this level that will set as soon as we get tramroad fixed. We are glad to say that our position has much improved in the past quarter, and that our returns have increased from 20 tons to 25 tons per four weeks. All the machinery throughout the mine continues to work most satisfactorily, and we find a great falling off in the water.—S. HARRIS, JOHN JAMES.

The CHAIRMAN said he did not think upon the present occasion it would be necessary to detain the meeting with any lengthened remarks, because the reports just read from the committee of management and also from the agents at the mine had put the shareholders in possession of the actual state of the property, and also as to its financial position. Upon the last occasion the committee ventured to express an opinion that there would now be a balance on the right side of the account, and that would, no doubt, have been the case had it not been for the unfortunate decline in the tin standard; but, notwithstanding the decline, it was a matter of congratulation that they had been able to reduce the debt by about 270*l.*, as compared with the balance at the last quarterly meeting; and it was a very satisfactory feature to find that, without unduly pressing upon the "reserves," the monthly sales of tin had increased in the present year, having been in January 14 tons, February 16 tons, March 20 tons, April 22 tons, May 24 tons, and yesterday they sold 25 tons—a practical proof that their agents did not compute imaginary values of lodes, as they were able to show actual results. Shareholders generally, perhaps, were not aware that since the last quarterly meeting there had been a fall in the standard for tin of no less than 14*l.* per ton, but yesterday, he was happy to say, the smelters advanced the price 3*l.* per ton, and, from the information they had obtained, there seemed a fair prospect the price will be further advanced. If the price should be increased Great Vor would very materially and rapidly reap the benefit of the advance. Having stated that he should be happy to answer any questions, he moved that the accounts be passed and allowed.

Mr. WILDE seconded the proposition, which was put and carried without discussion.

Mr. WILDE proposed the re-election of the committee of management. The shareholders had to thank those gentlemen for their services, for of late their position was almost to be commiserated. He hoped, however, from the reports just read, they would soon be tided into a more successful career.

A SHAREHOLDER had much pleasure in seconding the proposition. Those gentlemen well deserved the best thanks of the shareholders for the manner in which they continued to look after the company's interests.——The motion was put and carried.

Mr. MARSDEN, in moving the remuneration of 20 guineas to the committee, said he was sure there was not a shareholder who would not cordially vote in its favour, although for the moment the mine was not very prosperous.

The motion having been duly seconded, was put and carried.

Mr. W. Moates was re-elected auditor.

Mr. MARSDEN proposed that the best thanks of the shareholders be awarded to the Chairman for his courtesy and kindness in the chair, and for the readiness he always shows to afford explanations upon any point. But the statement he had just made was satisfactory and so fair that really nothing was left for him to ask. He (Mr. Marsden) was sure all present would join with him in expressing their thanks to that gentleman.——A SHAREHOLDER seconded the proposition, which was put and carried.

The CHAIRMAN, on behalf of his colleagues and himself, begged to sincerely thank the shareholders for their continued mark of confidence. One hon. proprietor said their position was to be commiserated, and if the actual position was traceable to any fault or failure of theirs, then, perhaps, it might be commiserated; the fact was that but for the price of tin the balance now would have been on the right side. The ball, however, had now begun to roll in a profitable direction; he hoped it would so continue, and that upon the next occasion the hope the committee ventured to express three months since would be realised. (Hear, hear.)

The meeting then separated.

MELLANEAR MINING COMPANY.

A general meeting of shareholders was held at the offices, Bartholomew House, on Wednesday, —Mr. HOWARD in the chair.

Mr. WILSON (the secretary) read the notice convening the meeting.

The report of the directors stated that as the influx of water in the spring of 1872 spoiled the prospects of profit for that year, so the terribly wet winter just past brought the underground works to a standstill for many weeks in February, March, and April of the present year, causing a heavy loss to the mine. Until the new shaft is deep enough, and communicated so as to drain to the bottom of the old shaft with the new engine, it is feared they would be constantly in danger of interruptions through the water. The work of sinking the new shaft, however, proceeds rapidly, and will be pushed as much as possible. The new and powerful 80 in. pumping-engine was set to work some time since, as well as the new winding-engine; the buildings and erections involved a heavy outlay, but have added a permanent value to the mine more than commensurate with it. The value of the copper sold in 1872 increased to 5168*l.* 0*s.* 4*d.*, which under ordinary circumstances would have left a profit, but the enormous and unparalleled rise in the price of coal, timber, and iron has been another source of heavy loss to the company, as it has doubled these expenditures. The disappointment in the expected returns has caused the directors the greatest anxiety in providing the necessary ways and means, in the face of such unlooked-for contingences as having to meet a doubled expenditure, with a diminution of expected receipts, and they are necessitated to ask the shareholders to extend the borrowing powers of the company, limited to 1000*l.* by the Articles of Association. With respect to the future of the mine, with reserve of copper valued at 35,000*l.* by their agents, no doubt should exist, as the new machinery is completed, and the only current expenses of shaft sinking have to be incurred, expected to be amply provided for by the monthly sales of ore, which will now be very large, so that should no more unforeseen incidents occur to mar the fair promises that present themselves, large profits may be soon expected.

The report of the managers states that there is a good mine now laid open, having opened on a course of ore for more than 50 fms. in length and nearly 40 fms. in height, and the extreme point in length, height, and depth still productive. They consider that there is now at least 35,000*l.* worth of copper ore in reserve. But the great difficulties they have had to contend with in keeping down the water have prevented them from making anything near the amount of returns the position of the mine warrants. The boilers have been forced to such a degree that they got into a bad state, so much so that they were obliged to stop for repairs, which has prevented them from draining the mine to the bottom; this being done, they hope to be able to report the mine in fork to the bottom next week.

The CHAIRMAN said that the report really contained all the information possessed by the directors. Had it not been for exceptional causes there was no doubt the workings of the past year would have resulted in a good profit. He need hardly say it was beyond their power to control either the price of coal or labour, but as soon as Gundry's shaft had been sunk another 18 fms. the water charges would be greatly relieved, which at the present time was a most important consideration. He then moved that the report and accounts be received and adopted.

The motion having been duly seconded, was put and carried.

Messrs. Howard and Harvey, the retiring directors, were re-elected. Mr. Nisbet was re-elected auditor.

An extraordinary general meeting was then held, at which power was given to the directors to increase the borrowing powers from 1000*l.* to 5000*l.*

A vote of thanks to the Chairman closed the proceedings.

[For remainder of Meetings see to-day's Journal.]

FOREIGN MINING AND METALLURGY.

At Paris, after a rather sensible fall, copper has experienced an advance of 4*l.* per ton on the receipt of more encouraging advices from London. Chilian in bars, to be delivered at Havre, has made 91*l.*; ditto in ingots, 96*l.*; and Corocoro minerals, 94*l.* per ton. The Havre copper market has presented few points of interest. The stock of copper at Havre at the close of May, 1873, amounted to 1950 tons, as compared with 400 tons at the close of May, 1872. The tone of the German copper markets has been generally one of increased feebleness. The Paris tin market has continued to give way; Banca, delivered at Havre or Paris, has brought 145*l.*; Straits ditto, 144*l.*; and English, delivered at Havre or Rouen, 144*l.* per ton. At Marseilles there has been very little business doing, and prices have scarcely varied. The Rotterdam tin market has been in a languishing state; Banca has been dealt in at 79¼ fls. to 79½ fls., and Billiton at 79 fls. In Germany tin has attracted comparatively little attention, and prices have been rather drooping. At Hamburg purchases have only been made to meet the comparatively unimportant requirements of consumption. At Paris, French lead, delivered at Paris, has brought 24*l.* 8*s.*; Spanish, delivered at Havre, 24*l.* 12*s.*; English ditto, 24*l.* 12*s.*; and Belgian and German, delivered at Paris, 24*l.* 12*s.* per ton. In Germany lead quotations have experienced scarcely any variation. As regards zinc, it may be noted that at Paris Silesian and other good marks have been quoted uniformly at 29*l.* per ton. In Germany lead has been more quiet, but at the same time prices have not experienced any change; scarcely any transactions have been noted at Breslau and Hamburg.

The coal question still excites a good deal of interest in Belgium. It could not well be otherwise, since of the prosperty which followed the Franco-German war few traces now remain. Metallurgical industry is in a suffering condition, and is extinguishing its furnaces; the glass manufacture sustains itself with difficulty, the sugarworks are moving on badly, and the building trade is much depressed, and all because coal is so dear. However, be this as it may, the price of coal exhibits at present comparatively little change upon the Belgian markets, although coke, which is more immediately affected by the heaviness of the iron trade, has experienced a good many grave oscillations. Coal is being stocked in the Charleroi basin; the accumulation is said to have proceeded of late at the rate of rather more than 5000 tons per day, and it is expected that next month the basin will have stocks to the amount of 300,000 tons. Last year at this season the local coalowners were not only enabled to dispose of their daily production, but they also succeeded in working up their stocks of coal into the bargain. The comparison is a strong proof of the depression under which various industries now labour in Belgium. The Paris coal market is said to be almost as well fortified with stocks as it usually is at the approach of winter. As regards the five great railways of France—the Northern, the Eastern, the Paris, Lyons, and Mediterranean, the Orleans, and the Western—they have also been accumulating supplies of late, and their stocks are now estimated to be 180,000 tons larger than in June, 1872. These circumstances point to a probable decline in the price of coal in France and Belgium.

The condition of the Belgian iron trade has not improved, and it may be said to have become worse, as it is every day more difficult for ironmasters to support the depression of the times. Vague hopes are, at the same time, entertained of an early revival in affairs, and of increased strength in quotations. But these hopes are only hopes, and for the present, with the exception of plates, in which some transactions are reported at 16*l.* 16*s.* per ton for No. 2, the iron trade generally is in a state of depression. Merchants' iron is neglected, at 12*l.* per ton for No. 1; comparatively few transactions have taken place, and the production is being every day further reduced; this state of affairs seems to indicate but little confidence in the maintenance of present rates. There has been comparatively little doing in refining pig, and prices have been rarely carried beyond 5*l.* 12*s.* per ton. A rather important adjudication—comprising 12,000 tons of steel rails, and a corresponding quantity of iron rails—is to take place next month for the Belgian State railways. The Couillet Company is stated to have concluded some small contracts on foreign account, at something over 13*l.* per ton. The Ougrée Ironworks Company will pay, on July 1, its dividend for the year 1872; this dividend is 7*l.* per share.

The aspect of the French coal trade is just now doubtful and undecided; prices are maintained, but there is great hesitation observable on the part both of coal merchants and coal consumers. Arrivals of coal are taking place at Paris with regularity, and many merchants are selling at slightly lower rates—some even with an eagerness that a profound conviction of an approaching fall in prices can alone justify. M. Michel Chevalier, in the *Economiste Francais*, energetically protests against the waste of coal which now takes place in industrial enterprises and in domestic consumption.

In the French iron trade affairs do not revive. Quotations remain

at the same point without being more generally accepted, and there seems no prospect of any real improvement in affairs until a fall takes place in coal. Coalowners are, however, still making every effort to maintain prices. A number of metallurgists are of opinion that a decline in prices would induce transactions, but even as prices now stand the profits realised are too small, and firms and companies naturally hesitate to work at a loss in order to attain a doubtful advantage. At Paris iron for building purposes is a good deal neglected; not only is the building trade by no means in a flourishing condition, but contractors also exhibit an increasing inclination to employ less iron, and to use instead wood and other materials. In the Nord a downward tendency is becoming general; several works have made some concessions in prices, and they appear disposed to continue the experiment. In the Haute-Marne prices are maintained, but the consequence is that scarcely any business is taking place; wire has been declining. In spite, however, of all current difficulties, new metallurgical establishments are being developed in France. Thus the Châtillon and Commentry Forges Company has just established a number of blast furnaces at Beaucaire. The Besançon forgemasters have just held their quarterly meeting. The state of affairs was considered tolerably favourable, and the average quotation for fine pig was fixed at 9*l.* 12s. per ton.

The Neu Essen (Prussia) Minerals Company has been paying during the last few days a dividend at the rate of 30 per cent. per annum for 1872. The profits realised by the Montrambert Collieries Company in 1872 amounted to 117,477*l.*; the dividend for the year has been fixed at 1*l.* per share, 24,157*l.* being at the same time carried to a contingency fund. The profits realised by the Châtillon and Commentry Forges Company last year amounted to 55,383*l.*; this handsome amount admitted of the payment of a dividend of 2*l.* per share, of which 1*l.* 4s. per share will be payable on Sept. 15. Notwithstanding the political crisis through which Spain has been passing for many months past—a crisis which has adversely affected the sale of zinc, and also somewhat impeded the company's working operations—the Royal Asturian Mines Company contrived to realise last year a profit of 54,844*l.*, out of which a dividend is to be paid at the rate of 2*l.* per share. The Nouvelle Montagne Company appears to have had a tolerably favourable time of it last year; the profits of the twelve months were 17,500*l.*, as compared with 10,800*l.* in 1871; the dividend upon the company's share capital for 1872 is to be at the rate of 10 per cent. per annum. The Belgian Collieries Company benefited, of course, from the great price of coal last year; the profits of the 12 months were 36,758*l.*, or about 150 per cent. more than in 1871. The dividend upon the share capital of the concern for 1872 is to be at the rate of 8 per cent. per annum.

FOREIGN MINES.

ST. JOHN DEL REY.—The directors have received the following report, dated Morro Velho, May 17:—Sinking of shafts 15 days in May: Shaft A sunk 2 fms. 1 ft. 3 in.: total depth, 159 fms. 2 ft. 1 in. Shaft B sunk 1 fm. 4 ft. 9 in.: total depth, 157 fms. 5 ft. 7 in.: total depth, 4 fathoms. The sump of A continues sound and solid.

DON PEDRO.—Report for April: Produce, 1606*l.* 1s. 6d.; cost, 3645*l.* 10s. 8d.: loss, 2038*l.* 9s. 2d. This month's cost is adversely affected by exceptional payments for carriage and salary accounts (amounting to 168*l.* 19s. 4d.), a large quantity of timber issued, and an unfavourable rate of exchange.—First Division of May: Produce weighed to date, 1434 ozs.

ROSSA GRANDE.—The cost for April inclusive of 55*l.* 10s. 3d. charged towards the construction of the Bahu stamps, and 5*l.* 2s. 9d. on account of making a rego for bringing home to the Bahu Mine the water from the Corrego das Vellas, amounts to Rs. 8246 8532 at 27d. ex.=927*l.* 14s. 8d., and the total daily average of force has been 161/3. The rego referred to is commenced in order to bring home an increased supply of water, and seeing that the outlay which will be incurred is trifling when compared with the advantages derivable during the dry season, I have not hesitated in setting about this work. We are making good progress towards erecting the Bahu stamping mill. Operations in the mine continue to progress steadily, and the lodes are still opening out satisfactorily. The gold obtained from samples taken during the month has amounted to 5 ozs. The ore put to pile from this mine during the month amounted to 19 tons.—First Division of May—Extract from letter dated May 16: Estimates of backs laid open during April—Bahu: 926 tons by 8 ozs. per ton=5008 ozs. of gold.—Cachoeira: 99 tons by 6 ozs. per ton =594 ozs. of gold.

GENERAL BRAZILIAN.—Capt. Thomas Treloar reports under date May 16: When I left England in October last I felt sanguine of early success, but, on arriving here, I found matters so contrary to what I expected, and success then so doubtful, that, as I advised, I set to work on a forlorn hope. The difficulties I surmounted, and a month ago I expected that before the end of the current month some shoots of gold, both at St. Anna and Itabira, would be reached; but at present I am afraid it will not be so. More work has presented itself than I anticipated, but even so I feel that success is still within my reach.

CHICAGO.—Ten days' run with one furnace; 230 tons treated. Gross proceeds 813,500, leaving net profit, after deducting mining and furnace expenses, 87,250.

JAVALI.—The directors have issued the report from Capt. Sohns, confirmatory of the statement published recently with respect to the condition of the property. The result of the 20 stamps worked during 1871 is 173 days, crushing 2625 tons of ore, yielding 3368 oz. of gold, at an average of 7 dwts. 13 grs. per ton; while during 1872, 172 days, crushing 3854 tons of ore, yielded 2971 oz. of gold, at an average of 6 dwts. 8 grs. per ton. Capt. Sohns, after entering very fully into details, says:—"Taking these matters into consideration, you will certainly find that I am right in my calculations. Profit: 2965 oz. of gold will be obtained by 30 stamps running in one year; the value of this will be (say) 19,500*l.*; deduct 7500*l.* for working expenses at the mine, leaves us a profit of 12,000*l.* The office expenses in England, together with the few stores sent out here, will be (say) 1000*l.*, thus making a clear profit of 11,000*l.* But after some time we shall have our produce still further increased by the erection of the tailing mill, which I calculate to give a result of from 100 to 150 oz. of gold per month, making about 1500 oz. more in the year: the value of these 1500 oz. will be (say) 3525*l.*, added to the profit above stated, will increase the total profit to 14,525*l.* The expenditure will in time be still further reduced—first, by the building of the before mentioned reservoir, and thereby doing away with the engine: and, secondly, by the introduction of Coolie labourers, which it is my intention to do. With regard to my foreign workmen here, I have very great pleasure in being able to state that I am perfectly satisfied, and believe that no other company could possess men who work with greater interest for its welfare. In concluding, I beg to remind my fellow shareholders of the heavy amount of interest which has been paid upon the debentures (about 1500*l.* per annum). We require only 1000*l.* more to be able to declare a dividend of 5 per cent.: and in order to do this next year, I would advise the immediate taking up of the unallotted shares, and thus to pay off this heavy burden. For the accuracy of the above statements I pledge my honour and reputation."

RICHMOND CONSOLIDATED.—Cablegram from the mine at Eureka, Nevada:—"Hall, London: Last week's run, 845,000. Three furnaces."

I.X.L. (Gold and Silver).—L. Chalmers, May 26: The engine-shaft is down 1685½ ft., 11 ft. having been made since date of my last report. We had to clean the boiler and sink the pumps last week, which took away three shifts from sinking. There are now 51 feet only to sink to the 200, (say) six weeks' work. You will see from the slow progress made that I have greatly underestimated the cost of sinking. I did not anticipate so much water, nor that we should have to work in such hard rock. When the teams have a moment to spare they will haul 200 tons or so for us.

EXCHEQUER (Gold and Silver).—L. Chalmers, May 26: When I wrote you last I expected I should be rid of the mill carpenters in a fortnight, but I am not quite rid of them yet, Hendy's concentrators requiring more work to place than I anticipated. The labourers have dug out the tail race for the turbine to the depth and width required, and are now stoning it up. The large new pulley for the driving-shaft is made, and I hope to have the wheel running by Tuesday week. The team, looking in first-rate order, arrived on Thursday by the teamster's brother, who has been clearing away lumber from the ore station and log skids, preparatory to hauling ore on Tuesday from the mine to the mill, by which day I expect my teamster here; his wife's illness has prevented his being at hand sooner. My engine-shaft is still 16 ft. from the ledge, which means a month at the present rate of sinking. I cannot get to the reserves until the shaft is down to the ledge; if the ledge keeps the pitch it had in the same levels in the upper works—*i.e.*, if it remains the same as where we left it in the 140 (incline)—I hope to strike it in the 91, or in 16 feet more, but even if I do I shall push on to the 100 before I drive. Our shaft is now down 75 ft., only 8 ft. having been made in a fortnight. The rock is still very hard.

GOLD RUN.—O. S. Kipp, May 27: The work in the shaft progresses nicely. The machinery works well. Depth to-day at 12 o'clock noon, 103 feet. The gravel improves in quality and richness. The gravel is coarser than heretofore, and mostly quartz pebbles, which are good indications of channel. I feel confident of reporting to you very rich dirt soon.

SIERRA BUTTES.—Result of the working at the Sierra Buttes and Plumas Eureka Mines for May—Sierra Buttes Mine: Receipts, 837,932; cost of mining and milling, 820,570.—Plumas Eureka Mine: Receipts, 815,000. Eureka ran only seven days on good quartz balance Mammoth rock.

BUNKER HILL (California).—W. L. Palmer, May 28: The second run of ore yielded 314 per ton, and the cost of mining and milling was 85 per ton, showing a profit of 89 per ton. This is an improvement of 32 per ton over previous run, and you will carefully bear in mind that it is only the ordinary vein matter we are now working. Some of our ore (selected) will yield very high, certainly into the hundreds. Assay tests show much higher even than this. We shall work some of this later on, and show you some handsome results. The vein is very thick and strong, fully 100 ft. in thickness, and developments still continue favourable on all three levels. The lower levels are still showing a marked improvement.

MENZENBERG.—Capt. Roskilly, June 16: We are pushing on all our work with vigour, and we hope in about five or six weeks to begin to sink Dickins' shaft, which is at present 7½ lachters below the 23. The sinking of this shaft should be pushed on with all possible speed, and our attention is confined at present to this important point in order to intersect the lodes already opened upon, and, judging from the increased quantity of water met with in sinking Dickins' shaft, we are led to believe that we are in close proximity to the lode. Considering the important discovery in the adjoining mine (St. Josephberg) within the past few days, they having met with a lode 7 ft. wide (which traverses the entire length of our sett) producing some splendid yellow copper ore, I feel fully convinced as to the future of this mine, as the lode here at the same depth presents equally as good an indication as in St. Josephberg, and when developed will, I believe, open up a paying property.

BENSBERG.—June 14: We have still too much water in the open-cast to allow of getting carbonate. In the meantime we are getting wash ore, and preparing fresh ground. The old pump will be fixed in the shaft on Monday next, which with the new one now working will soon rid us of the water. Production of rock ore 20 tons of 10 per cent.; delivered, none.

[For remainder of Foreign Mines, see to-day's Journal.]

THE ROCKS AND GOONBARROW MINES, NEAR ST. AUSTELL.

By J. H. COLLINS, F.G.S. Read at the annual meeting of the Miners' Association of Cornwall and Devon.

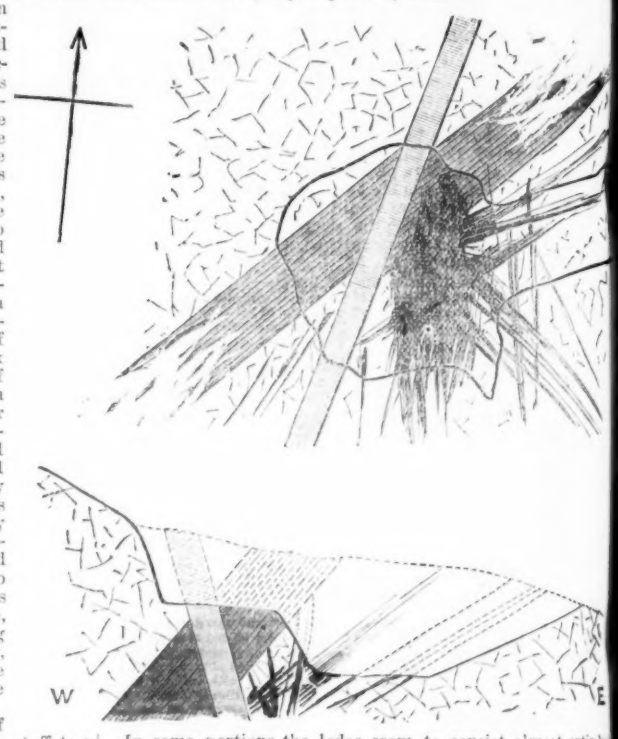
These mines are situated close to the village of Bugle, on the road from St. Austell to Bodmin. The sett is about 1½ mile long, and averages about ⅓rd mile in width. It is traversed in its longest direction by no fewer than ten east and west tin lodes, most of which have been worked extensively on their "backs," or outcrops, and several to depths of from 40 to 60 fathoms for a portion of their lengths. Reckoning from the southward, these lodes are known as Rawsons, Fleddry, Webbs, South, Rocks, Pauls, Goonbarrow (2), and two newly-discovered lodes. There are also several caunter lodes, which have yielded considerable quantities of tin in surface workings. The lodes which have been worked upon below the water-level to any extent are Webbs and Rocks—about the centre of the sett—and the two Goonbarrow lodes in their western portions. These workings are known to have been productive, and in some portions were exceedingly rich. Besides the tin lodes several highly ferruginous cross-courses, forming rich lodes of red and brown hematite iron, intersect the tin lodes almost at right angles. Among these are the famous "Ruby" lodes, and a shaft is now being sunk by the East Rocks Hematite Iron Ore Company for the purpose of working them. At present tin mining is carried on at two points only—viz., in a large open quarry in Rock Hill on one of the caunter lodes already mentioned, and in a pit on the back of Webb's lode, in the eastern part of the sett. The open working in Rock Hill in some respects resembles the "Stockwerke" of the German miners.

The main excavation is of a nearly circular form, not much less than 100 feet diameter and about 40 feet deep. Opening from this on the east side is another excavation, about 100 ft. long, 30 ft. wide, and 20 ft. deep. The hill consists of granite, the felspar of which is in parts completely decomposed, forming masses of china-clay, interspersed with grains of quartz and flakes of mica. The main pit is crossed by a large caunter tin lode, bearing nearly N.E., where opened upon, and this consists chiefly of schorl and quartz, but contains on an average from 6 lbs. to 8 lbs. of tin to the on of stuff. It is crossed at a very acute angle by a cross-course of very similar mineral character to the lode, and like it bearing tin, at any rate near the point of intersection. The cross-course bears nearly N., and it appears, as well as can be seen in the present condition of the workings, to heave the lode slightly to the right. The lode underlies N.W. about 2 ft. in the fathom, the cross-course underlies east about the same. Besides the lode and the cross-course, a great number of smaller lodes and branches traverse the pit in almost every direction. Many of them, however, appear to come together near the centre of the pit, a little east of the point of intersection of the two greater masses. These peculiar features, as they appeared towards the close of 1872, are indicated in the figures, but the numerous veins are so complicated and varied in direction, and the whole aspect of the pit varies so much from week to week, that they must be regarded as diagrams only. At some of the intersections rich bunches of tin occur, some containing 50 or even 60 per cent. of black tin. From one such bunch in the bottom pit 17 tons of tin were got out a year or two since. The lode itself, in its ordinary state, being very hard, will only pay for working on the most economical principles; but the occurrence of these branches, which are met with again and again at intervals, make it well worth while to proceed with the works. On this point Prof. Ansted has lately remarked as follows:—"This is one of a class of tin mines combining the certainty of an almost indefinite quantity of poor stuff, workable to a certain profit, with the prospect of rich and valuable deposits discovered by continued and intelligent exploring. Great care should be taken to observe the direction of the smaller strings and leaders of ore, and their relation to the better defined though, perhaps, not richer lodes. This can be done by combining regular mining operations with the ordinary open work, and by cross-cutting systematically in advance of the quarry to the settled ground on both sides. There can be no doubt of ultimate success."

At present the cost of breaking the very hard orestuff is 2s. 2d. per ton, but for this sum the takers tram the stuff to a Blake's stone-breaker, situated a little outside the pit, and pass it through the machine. It is then trammed to the stamps, about 130 yards off, and dressed on "owners' account." There are 48 heads of stamps, and these are capable, when fully worked, of stamping nearly 80 tons per day, notwithstanding its hardness, owing to the excellent disintegrating effect of the stone-breaker. At present about 200 tons per week are so treated, at a total cost of about 5s. per ton, but with an increased quantity the cost may probably be reduced to a little over 4s.

A few fathoms to the south-east of the pit is the famous Rock lode, which has been worked to good purpose in one portion of the sett, a little further east, at a depth of 60 fms. This and the caunter lode, as well as several of the other lodes, appear to be approaching each other as they go westward into the hill, so as to make a junction at some moderate distance from the present workings, and here it is likely a very rich bunch of tin is yet to be found. We have just commenced uncovering this lode east of the cross-course, and we find that the average produce of the uncovered portion is something like 56 lbs. of black tin to the ton of stuff. In all probability a very large deposit of tin will be found here, as the lode in the neighbourhood, and the Rock's lode itself, appear to "make" just east of the cross-courses.

To the chemical geologist these hard schorlaceous lodes or bands occurring in the decomposing granite are of great and especial interest, for they afford evidence of pseudomorphism on a very large scale. They present much more the appearance of veins of segregation than of true fissure veins, although a fissure has probably been the original determining cause of each one. Sometimes the fissures appear to have been re-opened at different epochs, as in so many lodes in other districts, but the schorlaceous and stanniferous matter which has passed into these fissures not finding room enough, has saturated, so to speak, the surrounding country. The complex lodes so formed appear to have been at one time full of large crystals of felspar (albite?) like the enclosing rock (country). These crystals have been in every case changed. In the country they now consist of kaolin—in the lodes the felspar has usually been replaced by quartz frequently by schorl (tourmaline), and occasionally by tin (cassiterite), or by tin and schorl together. In some instances the cavities are only partially filled, when they are seen to be lined with the replacing material in the state of crystals projecting inwards from the sides, or in a pasty or powdery form.



In some portions the lodes seem to consist almost entirely of quartz, with minute spots of schorl. In such cases some of the veins are filled with quartz crystals as fine as hairs, crossing and crossing each other, and closely resembling the beautiful silky specimens of needle bismuth (bismuthinite) recently found at East Pool Mine. Altogether the workings possess great interest, which in some respects varied almost from day to day. Quite recently a bed of china-clay has been discovered further to the southward, but still in Rock Hill. Operations, with a view of opening up this deposit, are being vigorously prosecuted at the present time.

MARK TWAIN ON LIFE-RAFTS.

When the Mississippi was burned at sea some time ago, and nearly all her boats were smashed in the effort to cast them loose, or were swamped the instant they struck the water, I wrote a private letter, suggesting that ships be provided with life-rafts instead of these almost useless boats. I did not expect that the Government would jump at the suggestion, and I was not disappointed. The Government had business on hand at the time which would benefit not only our nation, but the whole world—I mean the project of paying congressmen over again for work which they had already been paid to do—that is to say, the labour of receiving Credit Mobilier donations, and forgeting the circumstance. But that shining public benefit being accomplished, why cannot Goverment listen to me now?

The Atlantic had eight boats, of course—all steamers have. Not one of the boats saved a human life. The great, cumbersome things were shivered to atoms by the seas that swept over the stranded vessel. And suppose they had not been shivered, would the case have been better? Would not the frantic people have plunged pell-mell into each boat as it was launched, and instantly swamped it? They always do so. But a life-raft is a different thing. All the people you can put on it cannot swamp it. Nobody understands davit-falls but a sailor, and he does not when he is frightened, but any goose can heave a life-raft overboard, and then some wise man can throw him after it. The sort of life-raft I have in my mind is an American invention, consisting of three inflated horizontal rubber tubes, with a platform lashed on top. These rafts are of all sizes, from a little affair the size of your back-door to a raft 22 ft. long and 6 or 8 ft. wide. As you remember two men crossed the Atlantic from New York to London some years ago on one of these rafts of the latter size; that raft would carry 120 men. Nine such rafts would have save the Atlantic's 1060 souls, and these rafts (fully inflated and ready for use) would not have occupied as much room on her decks as four of her lubberly boats—hardly more than the room of three of her boats, indeed. Her boats were probably 30 ft. long, 7 ft. deep, and 7 or 8 ft. wide at the gunwales.

You could furnish a ship with medium and full sized rafts—an equal number of each—and pile them up on the space now occupied by four boats, and then you could expect to save all her people, not merely a dozen or two. They would sail away through a storm, sitting high and dry from 2 ft. to 4 ft. above the tops of the waves. In addition to the rafts the ship could carry a boat or two for promiscuous general service, and for the drowning of old fogies who like old-established ways. You could attach a raft to a ship with 10 fm. line, and heave it overboard on the lee side in the roughest sea (and it cannot fall any way but right side up), and there it will lie and ride the waves like a duck till it receives its freight of people and passengers, and then you can cut the line and let her go. But if you launch a boat it usually falls upside down, and if it does not people crowd in and swamp it. Boats have sometime gone safely with people and taken them to land, but such accidents are very rare.

I am not going upon a landsman's views upon this raft business, they are the views of several old sea captains or mates whom I have talked with, and their voice gives them weight and value. The Government has so many important things to attend to that we do not reasonably expect it to bother with life-rafts; and we cannot reasonably expect the English Government to bother with them, because this admirable contrivance is a Yankee invention, and our mother is not given to adopting our inventions until she has had time to hunt around among her documents, and discover that the crude idea originated with herself in some bygone time—then she adopts it, and builds a monument to the crude originator. England has our life-raft in exhibition in a museum there (the raft that made the wonderful voyage), and heaps of people have gone in every day for several years, and paid for the privilege of looking at it. Perhaps many a bereaved poor soul whose idols lie stark and dead under the waves that wash the beach of Nova Scotia may wish, as I do, that it had been on exhibition on board the betrayed Atlantic.

ANGLO-AMERICAN.

DIAMONDS IN THE HYDRAULIC WASHINGS OF CALIFORNIA.—At a recent meeting of the American Institute of Mining Engineers a paper was read by Prof. Silliman, "On the probable existence of Microscopic Diamonds, Zircons, and Topaz, in the sand of Hydraulic Washings in California." A small package of sand collected from the sluices of the Spring Valley Gravel Mining Claim was sent to the professor from San Francisco, and a microscopic examination shows it to abound in beautiful colourless zircons (hyacinths), of the form well known in the hyacinths of Expailly (France), associated with crystals of topaz, quartz in fragments, rounded grains of chromic and titanic iron, and a few small almost globular, masses of very high refracting power which appeared to be diamonds. To determine this chemically, a portion of the sand was treated with acid for the removal of any carbonates which might be present. There was no effervescence from this treatment. The same sample was then digested in strong hydrochloric acid of a high temperature to destroy any particles of organic matter which might be present, washed out in pure water without contact with organic matter, dried and ignited in a vessel of platinum out of contact with air. This sample of the sands thus freed from anything which could afford carbonic acid, but the diamond, was then ignited in a platinum nacelle (boat) in a tube of hard glass, and in a current of pure dry oxygen gas, which, for precaution, was passed over soda lime, and then, after passing the ignited assay, was delivered through a solution of baryta water. The transparency of this delicate test was soon disturbed, and by continuing the experiment for about an hour a notable quantity of byrata carbonate was obtained. This experiment seems to prove that diamond powder was present in small quantity. Under polarised light the crystalline sands form a splendid microscopic object. The sands were taken from the tailings after passing through a long flume paved with stone. Considering the sharp and hard pounding the gravel gets, mixed with boulders in a hydraulic flume, it seems likely that some diamonds are ground, or rather broken, by hard knocks to powder.

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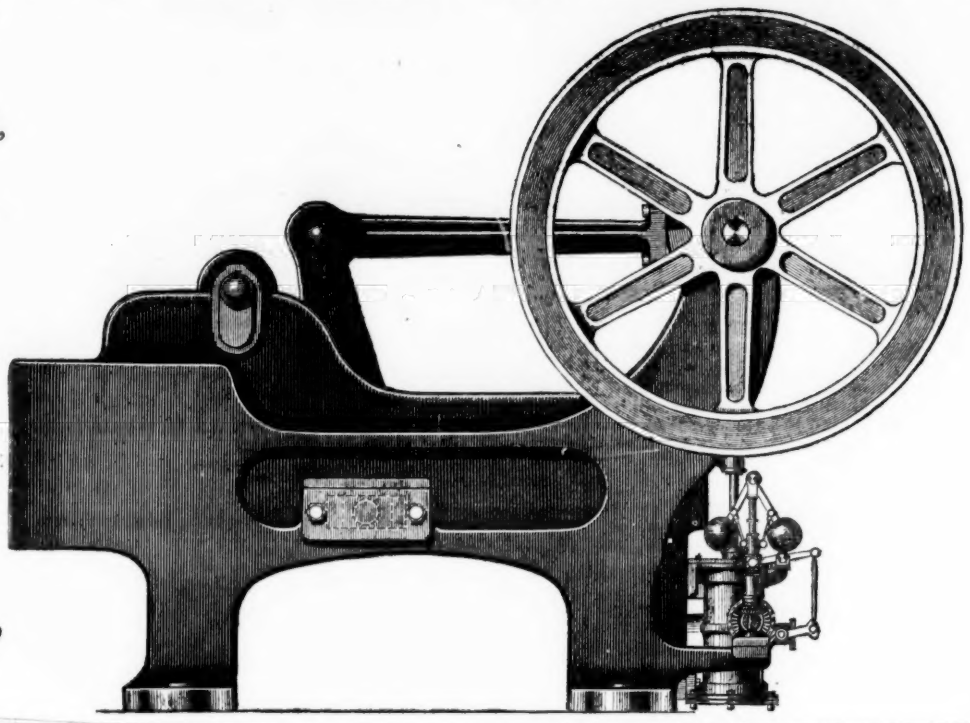

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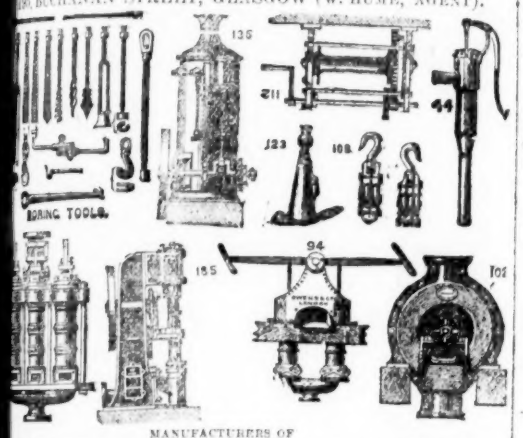

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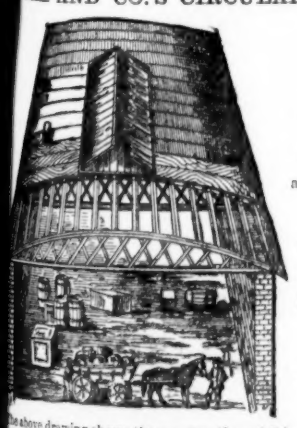

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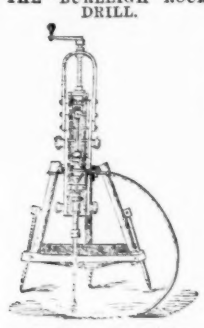
THE "BURLEIGH" ROCK-DRILLING MACHINERY

THOMAS BROWN,

PATENTEE AND SOLE PROPRIETOR.

THE "BURLEIGH" ROCK DRILL.



Machine and Stand for QUARRYING and SINKING.

This celebrated ROCK DRILL, which by reason of its inherent merits has superseded all other Rock Drills, is now in extensive use in America, England, Scotland, and the Continent, and is indispensable in the economic working of all Railway Cuttings, Shafts, Quarries, and Mines.

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Any labourer can work it, and it does not get out of order. It may be worked either by air or steam power, at will, without any alteration of the mechanism.

II.—ITS DURABILITY.

No part of the mechanism is exposed; it is all enclosed within the cylinder—so there is no risk of its being broken.

III.—ITS CAPABILITY.

In hard rock, like granite, gneiss, ironstone, quartz, the Tunnel Drill will progress at the incredible rate of 6 inches to 12 inches per minute. These machines can bore holes from 1 inch up to 5 inches in diameter, and, on an average, will go through 120 feet of rock per day—making 40 holes each from 2 to 3 feet deep. The drill can be used at any angle, and in any direction, and will drill and clear itself to any depth up to 20 feet.

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As compared with hand labour the saving in actual drilling is very considerable, from the fact of the "out put" being increased fourfold. The saving in the general expenses, and in the interest of capital, will be in a like ratio.

DRILL POINTS.

The saving in steel alone is incredible, ONE DRILL POINT WILL GO THROUGH TWENTY FEET OF ABERDEEN GRANITE WITHOUT SHARPENING. This fact will be duly appreciated by practical men.

For testimonials, estimates, and other information, apply to—

T. BROWN & CO., Engineers, 96, Newgate-street, London, E.C.

WILSON, McLAY, & CO., Sole Agents, 2, Talbot-court, Gracechurch-street, London, E.C.; and 87, St. Vincent-street, Glasgow.

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For driving the "Burleigh" Drill, or other Machinery.

The peculiar advantages which enhance the value of this Machine in the estimation of those who have it in practical use are—

1.—The pump pistons are driven by a steam-engine, the connection rods being attached to one crank shaft, the angles being so set that when the greatest power is developed in the steam cylinder the point of the greatest compression is being reached alternately in the air cylinders.

2.—The heat generated by compression of the air is reduced to *nil*.

3.—It is strong and durable compared with its effective power.

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Messrs. T. BROWN and Co., ENGINEERS, have much pleasure in calling attention to their IMPROVED MACHINERY for STONE BREAKING and QUARTZ CRUSHING, for crushing, grinding, and triturating Stone, Flint, Minerals, Ores, Chemicals, and other substances; for washing and separating Metals from Ores, and for extracting Gold from Quartz.

The principle of this invention is applied to machines of various construction, which contain within the range of their capability the power of reducing all hard materials to cubes of from ¼ inch to impalpable powder. The mechanical construction of each description of machine is specially adapted for its own peculiar work, and experience has shown that each is eminently suited for the work which it is designed.

They can be driven by water, steam, or horse power; they are light and portable, and their crushing and grinding surfaces are constructed that when worn they can easily be replaced.

If intending purchasers would send a sample of the material required to be crushed or broken it could be operated upon in their presence, and thus they would be guided in the selection of the machine best suited for their requirements.

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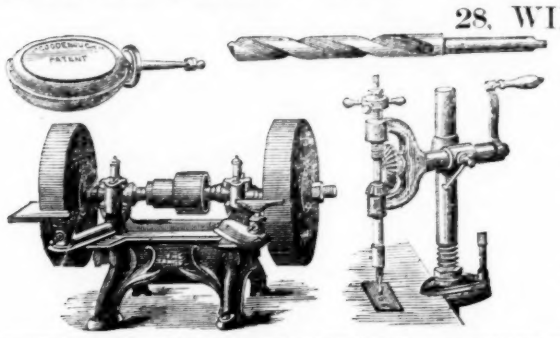
28, WILSON STREET, FINSBURY, LONDON, E.C.

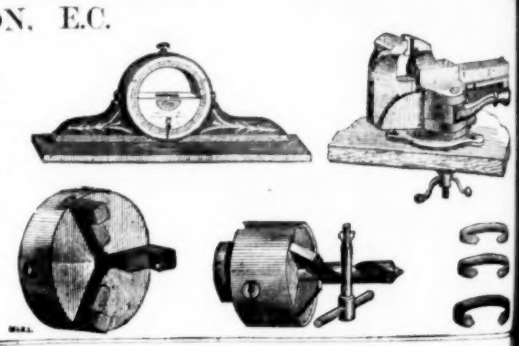


SOLE AGENTS FOR

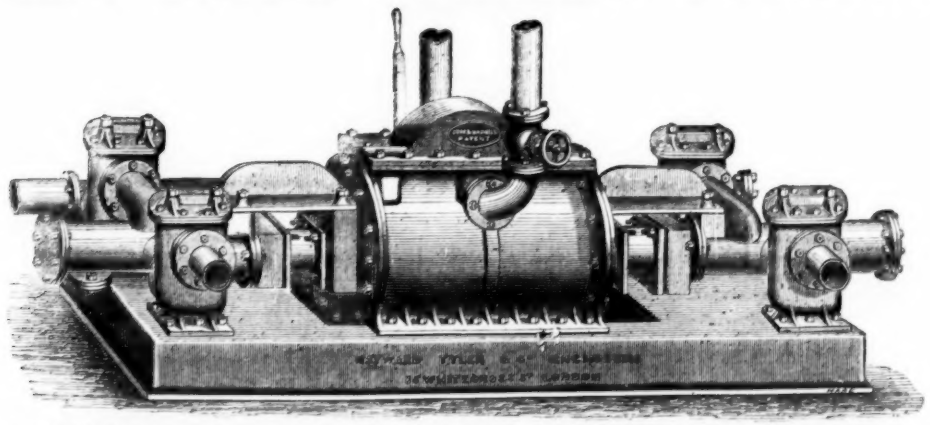
Morse's Twist Drill, and Machine Company's celebrated Twist Drills and Chucks; American Scroll Chucks; Stephens' Patent Vices; Parker's Patent Parallel and Swivel Vices; Gould Manufacturing Company's Well and Cistern Pumps; Washita, Arkansas, and Hindostan Oil Stones; and all other descriptions of American Tools and Machinery, &c., &c.

C. C. and Co. are prepared to give quotations and execute indents for American Goods of all descriptions, to be shipped to any port.

CATALOGUES AND PRICES CURRENT ON APPLICATION.



HAYWARD TYLER AND CO.'S PATENT STEAM PUMPING MACHINERY.



"About a year and a-half since a direct-acting pumping-engine was erected at the Trimdon Grange Colliery by Messrs. Hayward Tyler and Co., of London. The diameter of the steam-cylinder of this engine is 40 in., that of the rams 10 in., the pump-plungers having a 4 ft. stroke. The whole of the combined apparatus is carried on a solid bed-plate, and the pumps are so arranged that they can be drawn off endways, if required, a planed groove being formed in the bed plate to keep them true. A pumping-engine of this description requires no very accurate adjustment of level, as it is self-contained, and all the strains are direct from the steam-cylinder to the pumps, which at their underside are attached to the bed-plate, and are supported by a strong stay above. The engine at the Trimdon Colliery is placed in a headway cut for its reception, at a depth of 400 ft. from the surface, and a short distance from the main shaft. The pump takes its water from sump, into which the level drains. The pumping-engine continues to do its work in a satisfactory manner, and at a recent trial made by Mr. R. Forster, engineer it was found that the pump was throwing to bank, a distance of 400 ft. above itself, 245½ gallons of water per minute, the pump running at 10 strokes, thus doing 89·5 per cent. of its theoretical duty."—See *Engineering*, 3rd Jan., 1873.

Full particulars, references, testimonials, &c., post free, on application to—

HAYWARD TYLER AND CO.,

84 AND 85, UPPER WHITECROSS STREET, LONDON, E.C.

Prize Medal—International Exhibition, 1862.

CHAPLIN'S PATENT PORTABLE STEAM ENGINES, &c.,

FOR PUMPING AND WINDING.

These engines are SPECIALLY ADAPTED for PITS, QUARRIES, &c. They are EXCEEDINGLY SIMPLE in ARRANGEMENT and STRONG. NO FOUNDATION or CHIMNEY STALK being NECESSARY, they can be ERECTED or REMOVED with VERY LITTLE TROUBLE or EXPENSE, and are WELL ADAPTED for HOME or FOREIGN USE.

Sizes, from 2 to 25-horse power.

STEAM CRANES, STEAM WINCHES, CONTRACTORS' LOCOMOTIVES, HOISTING ENGINES, PUMPING AND WINDING GEARING, &c.

ALEXANDER CHAPLIN AND CO.,
CRANSTONHILL ENGINE WORKS, GLASGOW.

Agents in London for the SALE of our Manufactures
WIMSHURST & CO.

ROCK DRILLING MACHINERY.

Patent.

References, particulars, Estimates, &c., Sent on application.

CHARLES BALL AND CO., lately Sole Agents for
THE BURLEIGH ROCK DRILL,

ARE NOW PREPARED TO SUPPLY THEIR NEW

ROCK-BORING MACHINE, OR "POWER JUMPER,"

Which they consider far superior to any other Rock-boring Machinery existing, and which they have, therefore, undertaken to bring before the public. The Firm's principl

"INVENTORS OF NONE—AGENTS FOR THE BEST"

Secures to its customers the best known machinery, as the Firm is entirely impartial in its adoption of any particular style of machines.

THE "POWER JUMPER"

Is recommended to the public on account of its qualities, which are the following. It is—

CHEAPER,
SIMPLER,
LIGHTER,
SHORTER,
THAN ANY OTHER.
COMPARISON INVITED.

Secondhand
BURLEIGH DRILLS
FOR SALE.

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FIREPROOF
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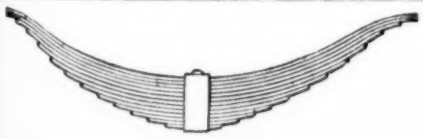
SALFORD, MANCHESTER.



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AILWAY SPRING COMPANY,
MILLSANDS, SHEFFIELD,

ing purchased from the Trustee of the late Firm of W. Charles Co. the extensive works, with the valuable and improved ma-ery, are prepared to execute orders for every description of
RAILWAY SPRINGS.

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PUMP LEATHER
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y a special method of preparation, this leather is made solid, perfectly close in ure, and impermeable to water; it has, therefore, all the qualifications essen- for pump buckets, and is the most durable material of which they can be made. ay be had of all dealers in leather, and of—

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THE GREAT ADVERTISING MEDIUM FOR WALES.
THE SOUTH WALES EVENING TELEGRAM
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SOUTH WALES GAZETTE
(WEEKLY), established 1857,
largest and most widely circulated papers in Monmouthshire and South Wales.
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e "Evening Telegram" is published daily, the first edition at Three P.M., the nd edition at Five P.M. On Friday, the "Telegram" is combined with the outh Wales Weekly G[a]zette," and advertisements ordered for not less than six ecutive insertions wi be inserted at an uniform charge in both papers.
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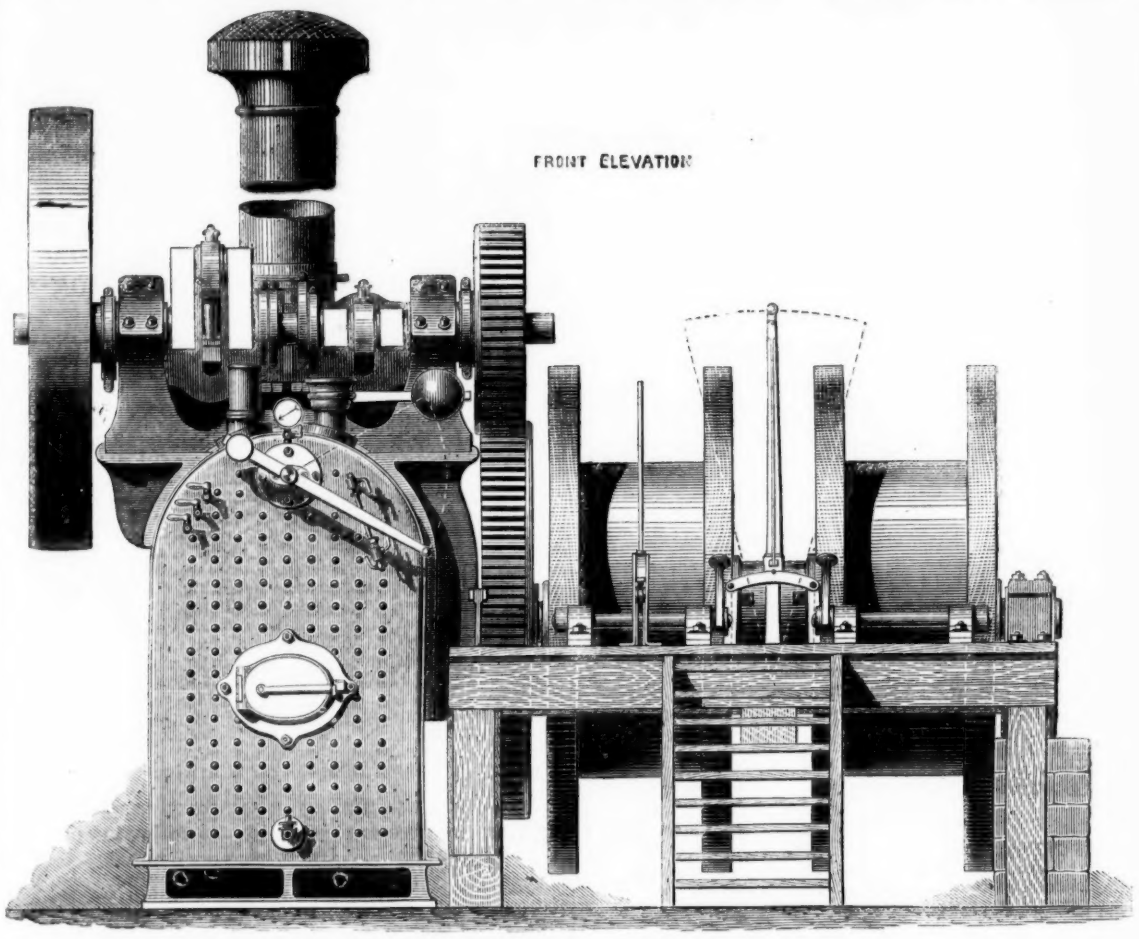

FROM 20 TO 200 EFFECTIVE HORSE-POWER.

FOR FULL PARTICULARS AND PRICES, APPLY TO—

ROBEY AND COMPANY, LIMITED,
PERSEVERANCE IRONWORKS, LINCOLN.

ALSO OF PATENT PORTABLE

HAULING AND WINDING ENGINE
WITH
PATENT DRUM WINDLASSES,
FOR MINING PURPOSES.

This Engine is specially commended to Mining Engineers and others, as by its adoption—
Haulage along inclined drifts is easily and cheaply effected;
The expense of sinking new shafts is greatly reduced, neither foundations nor engine-house being required
It is available not only for winding, but for pumping, sawing, &c.—a great desideratum at a large colliery;
It can be very quickly removed (being self-propelling), and fixed in any desired position.
Prices and full particulars on application as above, and also references to view the engine in successful work near Derby, Carnarvon, Haverfordwest, Darlington, Durham, Penzance, and other places.

THESE ENGINES WORK WITH MARVELLOUS ECONOMY IN FUEL.

CHAS. PRICE AND CO.'S RANGOON ENGINE OIL,
AS SUPPLIED TO H.M. DOCKYARDS AND FLEET.

THIS OIL is suitable to every kind of Machinery. As a lubricant it is equal to the best Sperm or Lard Oil, while it possesses the great advantage of being entirely free from any principle which wil corrode the metal bearings.

For particular kinds of Machinery, the Oil may be specially prepared of a consistency and character adapted to the nature of the work to be done.

"Chemical Laboratory, 7, Printing House-square, Blackfriars, April, 1869.

"I herewith certify that the Rangoon Engine Oil, manufactured by Messrs. Chas. Price and Co., is free from any material which can produce corrosion of the metal work of machinery. It is indeed calculated to protect metallic surfaces from oxidation.

"The lubricating power of this oil is equal to Sperm or Lard Oil.

"T. W. KEATES, F.C.S., &c, &c

Every parcel of the Oil sent from the work bears the Trade Mark of the Firm.

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WORKS: MILLWALL, POPLAR; and ERITH, KENT

VIENNA EXHIBITION, GROUP XIII, STAND No. 457. INTERNATIONAL EXHIBITION, LONDON, No. 2 ENGINE SHED, WEST SI

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CORNWALL WORKS (TANGYE BROTHERS), BIRMINGHAM,

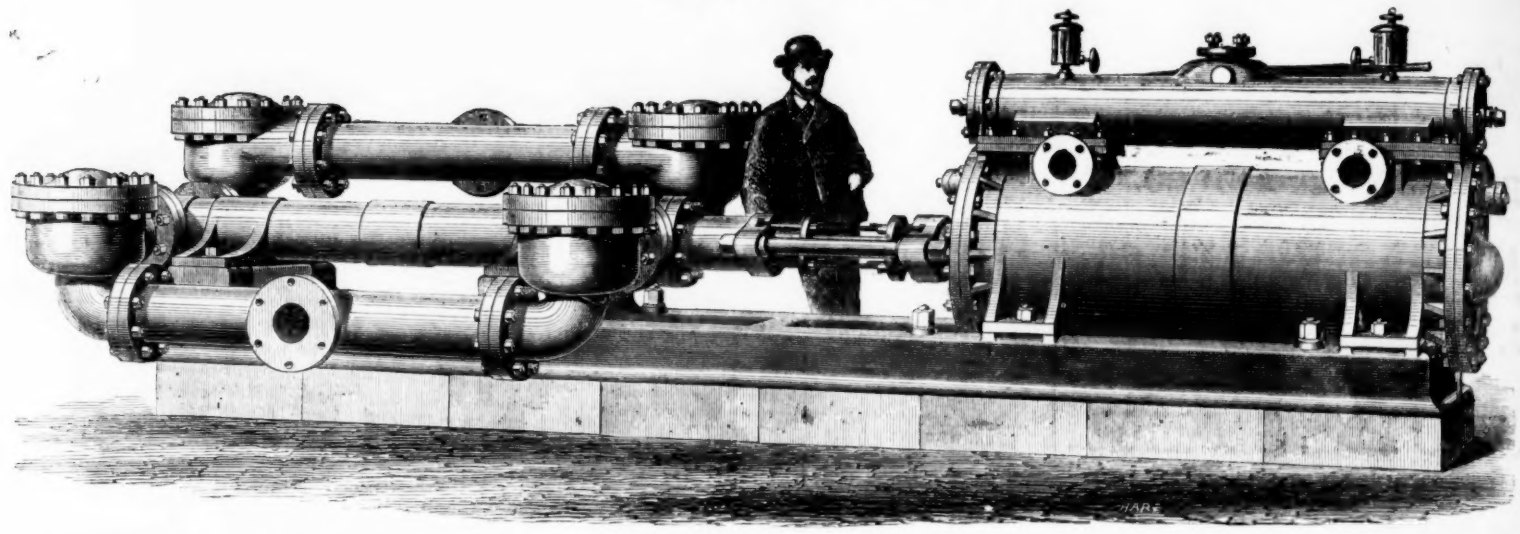
NEWCASTLE-ON-TYYE (TANGYE BROTHERS AND RAKE), OFFICES AND WAREHOUSE, ST. NICHOLAS' BUILDINGS.

SOLE MAKERS OF

THE "SPECIAL" DIRECT-ACTING STEAM PUMPING ENGIN

FOR FORCING WATER FROM MINES.

Nearly 3000 in Use.



The "SPECIAL" Direct-acting Steam Pumping Engines require no costly Engine Houses or massive foundations, no repetition of Plunger Lifts, ponderous Connecting-rods, or complication of Pitwork, and allow a clear shaft for hauling purposes.

Extract from "ENGINEERING," September 6th, 1872:—

"The accompanying engraving illustrates a large specimen of the 'Special' Steam Pump, which was brought before the public about four years since by Messrs. Tangye Brothers and Holman. The Pump is the invention of Mr. S. Cameron, of New York, and since its introduction Messrs. Tangye have turned out nearly 3000 from their works.

"These pumps are of various sizes, and at first only small ones were made, but as their usefulness became developed the manufacturers designed pumping engines on the same principle for use in collieries. They were first applied to this purpose in the Newcastle collieries about three years since, and through the efforts of the late Mr. A. Stansfield Rake, under the direction of Messrs. Tangye, about 130 of these pumps had been introduced—principally in the collieries of the Durham and Newcastle districts, up to the end of 1870. They were adapted to perform the required duty—varying in almost every case—of forcing from 1000 to 10,000 gallons per hour from depths ranging from 100 to 500 ft. The succes of this system of pumps led Mr. J. Bigland, the manager of Messrs. Pease's Bishop Auckland Collieries, to conclude that it was adapted for yet heavier work. The result of his investigations into its working led to the manufacture of the engine we have illustrated, for the Adelaide Collieries, belonging to Messrs. Pease, at Bishop Auckland.

"The construction of the Special Steam Pump is so well known that we need now do no more than refer to the dimensions of the various parts. The steam cylinder is 26 in. diameter, and the pump—which is double acting—is 6½ in. diameter, with a 6-ft. stroke. The slide valve is steam-moved, and its alternate action is effected by means of two steel reversing valves, operated by the piston in the interior of the cylinder at either end. Hence there is no external mechanism except the piston rod, a few inches only of which is seen reciprocating between the stuffing boxes of the steam and pump cylinders. In the contract it was stipulated that the engine should raise 120 gallons per minute 1040 ft. high in a single lift, and this is more than accomplished, with apparently as much ease as if its load was delivered at only 100 ft. high.

"The engine-room at the Adelaide Collieries is situated at a depth of 1040 ft. below the surface, and is an arched chamber, about 100 ft. long by 20 ft. wide, and 10 ft. high at centre. At the far end of this chamber is a double-flued boiler, 27 ft. long and 7 ft. in diameter. Placed between the boiler and the shaft is the pumping engine we have been describing. It was started on June 6, 1871, and Mr. Bigland reported that, having measured its duty, he found the average of seven trials to be 137 gallons per minute, thus giving a higher duty than was stipulated for in the contract.

"A still larger Special Steam Pump than the one already described has since been made by Messrs. Tangye for Messrs. Stanniers collieries, Silverdale, Staffordshire. The steam cylinder of this engine is 32 in. in diameter, and the water cylinder 10½ in.; the stroke 6 ft., and the engine has to raise 22,500 gallons per hour 540 ft. high. Two out of eight engines for some extensive coal mines in Germany are also in a forward state; each of these engines is to be capable of raising 150 gallons per minute, or 9000 gallons per hour, 750 ft. high. This system of underground pumping engine undoubtedly carries with it the recommendations of simplicity and great power with a small number of mechanical parts. Its first cost is also very moderate, as compared with the method of raising water from great depths by a series of 40 or 50 fm. lifts. Its practical value was also tested in 1867 by the award of a silver medal by the Royal Polytechnic Society, which is composed chiefly of mining engineers. In fact, these engines appear to solve a very important commercial question in mining operations—viz., the most economical and effective means of deep mine drainage. Their success has been established in the coal mines of Durham and Newcastle, and there is no reason why their adoption should not follow, as occasion requires, in the copper and tin mines of Cornwall, some of which are of great depth; and especially for foreign mines, where transpoprt convenience and economy are of paramount consideration."

The "Special" Steam Pumping Engines are in use at the following among many other Collieries:—

Adelaide Colliery, Bishop Auckland	3 Pumps.	North Bitchburn Colliery, Darlington	2 Pumps.	Stott, James and Company, Burslem	1 Pump.
Acomb Colliery, Hexham	1 „	Newton Cap Colliery, Darlington	1 „	Straker and Love, Brancepeth Colliery	1 „
Blackfell Colliery, Gateshead	1 „	Normanby Mines	1 „	Seaton Delaval Coal Colliery, near Newcastle	1 „
Black Boy Colliery, Gateshead	1 „	Oakenshaw Colliery	1 „	Thornley Colliery, Ferryhill	2 „
Castle Eden Colliery	2 „	Pease's West Colliery	2 „	Thompson, John, Gateshead	2 „
Carr, W. C., Newcastle	4 „	Pease, J. and J. W., near Crook	5 „	Trimdon Grange Colliery	1 „
Etherley Colliery	1 „	Pease, J. and J., Brandon Colliery	1 „	Tudhoe Colliery	4 „
Gidlow, T., Wigan	3 „	Pegswood Colliery, near Morpeth	2 „	Vobster and Mells Colliery	2 „
Haswell, Shotton and Easington Coal Company	3 „	Pelton Fell Colliery	1 „	Widdrington Colliery, Morpeth	5 „
Lochgelly Iron and Coal Company	2 „	Railey Fell Colliery, Darlington	1 „	Whitworth and Spennymoor Colliery	5 „
Lochore and Capeldrae Cannel Coal Company	6 „	Right Hon. Earl Durham, Fence Houses	1 „	Westerton Colliery, Bishop Auckland	1 „
Leather, J. T., near Leeds	2 „	Skelton Mines	1 „	Wardley Colliery, Gateshead	1 „
Lumley Colliery, Fence Houses	1 „	South Benwell Colliery	5 „	Westminster Brymbo Coal Company	2 „
Monkwearmouth Colliery, Sunderland	1 „	St. Helens (Tindale) Colliery	1 „	Weardale Coal and Iron Company	5 „

PARTICULARS OF THE "SPECIAL" STEAM PUMPING ENGINES SUITABLE FOR HIGH LIFTS IN MINES.

Diameter of Steam Cylinder ...Inches	6	8	10	8	12	16	10	14	18	21	14	18	21	26	16	21	26
Diameter of Water Cylinder ...Inches	3	3	3	4	4	4	5	5	5	5	6	6	6	6	7	7	7
Length of Stroke ...Inches	24	24	36	24	36	48	24	36	36	48	36	36	48	72	36	48	48
Strokes per minute ...	30	30	20	30	20	15	30	20	20	15	20	20	15	10	20	15	15
Gallons per hour ...	2,200	2,200	2,200	3,300	3,300	3,300	6,100	6,100	6,100	6,100	8,800	8,800	8,800	8,800	11,900	11,900	11,900
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump ...	240	425	665	240	540	960	240	470	775	1,058	320	540	740	1,140	312	540	700
Diameter of Suction and Delivery ...Inches	2	2	2	3	3	3	3½	3½	3½	3½	4	4	4	4	5	5	5
Diameter of Steam Inlet ...Inches	¾	1¼	1½	1½	2½	2½	1½	2½	3	3½	2½	3	3½	4	2½	3½	4
Diameter of Exhaust ...Inches	1	1½	1½	1½	2½	3	1¾	2½	3½	4	2½	3½	4	5	3	4	5

PARTICULARS, &c.—*Continued.*

Diameter of Steam Cylinder ...Inches	30	18	24	30	32	18	24	30	36	21	30	36	42	26	36	44	50
Diameter of Water Cylinder ...Inches	7	8	8	8	8	9	9	9	9	10	10	10	10	12	12	12	12
Diameter of Stroke ...Inches	72	36	48	72	72	36	48	48	72	48	72	72	72	48	72	72	96
Strokes per minute ...	10	20	15	10	10	20	15	15	10	15	10	10	10	15	10	10	10
Gallons per hour ...	11,900	15,660	15,660	15,660	15,660	19,800	19,800	19,800	19,800	24,400	24,400	24,400	24,400	35,240	35,240	35,240	35,240
Height in feet to which water can be raised with 40 lbs. pressure per square inch of steam at pump ...	1,100	300	540	840	960	240	427	665	960	264	540	780	1,062	282	540	800	1,060
Diameter of Suction and Delivery ...Inches	5	6	6	6	6	7	7	7	7	8	8	8	8	10	10	10	10
Diameter of Steam Inlet ...Inches	5	3	4	5	5½	3	4	5	6	3½	5	6	7	4	6	8	8½
Diameter of Exhaust ...Inches	6	3½	5	6	6½	3½	5	6	7	4	6	7	8	5	7	9	10

PRICES OF THE ABOVE ON APPLICATION.

Any combination can be made between the Steam and Water Cylinders, to suit Height of Lift and Pressure of Steam.

TANGYE BROTHERS & HOLMAN, 10, Laurence Pountney Lane, London, E.C.

Printed by RICHARD MIDDLETON, and published by HENRY ENGLISH (the proprietors), at their office, 26, FLEET STREET, E.C., where all communications are requested to be addressed.—*June 21, 1873.*